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Asian Industrialization: A strategic analysis with a memorandum on the Australian response

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Abstract

This essay considers the economic performance of East Asia's two largest economies in the second half of the twentieth century and debates prospects for the first half of the twenty-first. The discussion takes place in the context of dynamic strategy theory. First in Japan, and then later in China, 'developmental' states adopted strikingly successful industrialisation strategies with a common thread of outward orientation. Outward orientation is distinguished from export dependence. The former is an auto-catalyzing sub-strategy that can sustain an economy all the way to full membership of the strategic core. Outright export dependent strategies, in contrast, are finite and imitative rather than auto-catalyzing, leaving their practitioners highly exposed to adverse external shocks. Japan's experience of strategic rise, stagnation and eventual exhaustion is articulated at length to illustrate this important distinction.

China's own outward-oriented strategy, which is currently stimulating rapid economic growth and differs in many important respects from Japan's, is then analysed in an attempt to examine its future viability. China's prospects for adapting an alternative strategy prior to exhaustion are then considered. The conclusion is that it is reasonable to expect China's strategic leadership to attempt to transition towards a sub-strategy that continues to sponsor industrialization through exploitation of the mass internal market in the broad context of outward orientation. Furthermore, the contemporary sub-strategy is clearly far from exhausting itself. However, the risks are consequential. On balance, prospects for a successful transition are sound but not overwhelming. An Asian-facing resource rich economy such as Australia should actively hedge the risks of unsuccessful transition.

In the face of this uncertainty, Australian strategists are thankfully not facing an independent binary choice. To hedge against the possibility of the more pessimistic projections coming to fruition in China, thereby unhinging a resource dependent sub-strategy, Australia must make an independent effort to make an assertive move towards the upper echelons of productivity performance. This will involve a wholesale reassessment of the scale of national resources that should be directed to the innovation infrastructure.

*Keywords***:** Asian industrialisation, Chinese and Japanese strategic pursuit, dynamic-strategy theory, Snooksian strategy function, Australian economic policy.

*JEL Codes***:** 011, 053, N1, N15.

1. Introduction

East Asia[1] represented approximately 15% of world output in 1950. By 1975, led by the rapid expansion of Japan, that share had risen to 20%. At the turn of the millennium East Asia was contributing 25% of output, despite the temporary setback of a deep recession in 1997-98 and Japan's diabolical performance in the 1990s.

Figure 1.1 shows how impressive this performance has been in comparative historical perspective. The underlying data are from Maddison (2003). The curves illustrate twenty year periods when a prominent region or country made relatively rapid gains in its share of global growth. Japanese expansion between 1954 and 1974 is the most dramatic economic rise in the historical record. China's re-integration with the global economy after 1978 is a close second. The diffusion of Britain's industralisation strategy to Western Europe in the nineteenth century looks somewhat meek in comparison, while the rise of the post-bellum United States was consistent and protracted rather than explosive.

This superior economic performance has attracted a great deal of attention from scholars across the social sciences. Orthodox economists have sought to account for the sources of this "miraculous" growth (Denison & Chung 1976, Young 1995, Krugman 1994, IMF 2006, Wang 2007). Development economists have found East Asia a fertile testing ground for the generalized theories put forward in other contexts (Fei & Ranis 1964, Minami 1973, Rosovsky 1979, Sugihara 2007). Political scientists and economists outside the mainstream have highlighted the elevated role of East Asian 'developmental states' (Johnson 1982, Amsden 1989, Wade 1990, Haggard 1996, Woo-Cumings 1999, Yamamura, Chang & Rowthorn 1995, Evans 1995). Others have been drawn to distinctive Asian firm structures and the institutionalized links between finance and industry (Zysman 1983, Aoki and Patrick 1994, Sheard 1996, Woo 1999, Vitols 2001, Tipton 2007). Economic historians and comparative political economists have also made much of the "non-liberal" approach of East Asia (Dore 2000, Streek 2001, Yamamura 2003). The implication of East Asian economic growth for the global balance of power, first in the Japanese context and now increasingly with respect to China, has been an especially productive theme (Vogel 1979, Garnaut 1989, Thurow 1992, Fallows 1994, Nye 2004, Kim 2004, Calder 1995, Bernstein and Munro 1997).

This vast literature has identified the proximate drivers of Asian economic growth as a high savings rate, the rapid investment rates it facilitated, a demographic dividend and large scale urbanization, technological and productivity catch-up, and centrally, an outward orientation for manufacturing. Alongside these macroeconomic fundamentals are distinctively 'Asian' institutions, including the developmental leadership of the state (in the form of an elite bureaucracy) so painstakingly documented by successive generations of scholars. An amalgam of these observations has become the consensus model of East Asian economic development.

Missing from this body of work is a coherent dynamic theory that makes systematic sense of East Asia's rise in the broadest context. This essay attempts to make an initial attempt at stitching the breach. The framework adopted owes a profound debt to the cumulative

work of Graeme Snooks (1993, 1996, 1997, 1998a, 1998b, 1999). The general Snooksian model of global strategic transition (1999), a corollary of dynamic strategy theory (1996, 1998a) is the apposite starting point for the analysis of East Asian economic development.

The argument revolves around a form of the Snooksian strategy function (1999: chapter 12) modestly adapted to the East Asian economic experience. This model of dynamic interaction between the strategic outcome and strategic instruments is first applied to the Japanese experience of rise, stagnation and exhaustion in the second half the twentieth century. The finite nature of Japan's industrialization strategy once it had transitioned from outward orientation to export dependence is clearly illustrated. Policy failures at critical moments of the potential transition phase condemned the economy to a point of outright strategic exhaustion and deflation in the 1990s.

The discussion then proceeds to China. An equivalent theoretical grid is brought to bear upon the Middle Kingdom. The initial task is to assess the approximate time at which China's own outward oriented industrialization sub-strategy might exhaust itself. The basic conclusion is that China has some time yet – measured perhaps in decades rather than years – before its contemporary sub-strategy exhausts completely. The extension task is to assess Chinese prospects for successful transition to an eventual replacement strategy, a task at which Japan failed in the last twenty years of the twentieth century. The conclusion is that China will do better than Japan regarding this fundamental imperative.

Despite cautious optimism regarding China's strategic prospects, the risk that China exhausts its contemporary strategy earlier than anticipated without a substitute in place, and that China thereby suffers a period of stagnation or worse, are not zero. Ergo, it would be poor policy for those states that benefit most from the current and prospective 'China boom' to eschew the challenges of active strategic pursuit in favour of passive reliance on the resource terms of trade to fuel long run prosperity. In short, an Asian-facing country such as Australia should hedge the risks of unsuccessful strategic transition in China. The paper will conclude with some observations specific to the Australian context. The main prescription for Australian policy makers is that a dual track of investment in the innovation and physical infrastructure is called for, on a scale not yet conceived of in the timid ambitions of past administrations.

2. The strategy function and the strategic transition

This section formally introduces the strategy function.

$$O = f(N, K, R, T, E, S_O, S_L, S_I) \qquad (1)$$

The strategic outcome, O, is proxied by gross domestic product $(GDP)^2$. O is a function of strategic instruments: N is labour, K is the capital stock, R is natural resource endowment, T is the stock of available technology, tacit and realisable, E is economies of scale, and S is 'strategic', with subscripts O, L and I representing organizations,

leadership[3] and ideas respectively (Snooks 1999: 219). In lay terms, the left hand side is the "end" and the right hand side is the "means".

Function (1) can be simplified to

$$O = f(P, T, E, \pi) \qquad (2)$$

P represents the stock of physical inputs: labour, resources and capital. T and E are unchanged from their definitions in (1). The π signifies a vector comprised of the strategic variables S_O, S_L and S_I. Expanding further, π is an increasing function of strategic confidence (subscript C) and the price signal, strategic inflation (subscript P).

$$\pi = f(S_C, S_P) \qquad (3)$$

So, the strategic outcome O relies upon physical factors, technological factors and strategic factors. The feedback mechanisms between these factors, which are determined by the strategic pursuits of materialist man (Snooks 1996), endow the model with dynamic characteristics. The underlying concept that allows the induction of the strategy function is that of strategic demand (Snooks 1998: 141-165). Strategic demand is the effective realizable desire of decision makers regarding the gamut of inputs relevant to their survival and prosperity. This driving force manifests itself in the pursuit of dynamic strategies and sub-strategies.

The natures of the strategic factors that enter the function are time and context variant. They depend upon the technological underpinnings of the prevailing dynamic strategy and the sub-strategies that are pursued under its rubric. The nature of π under a conquest strategy will be very different to π in the context of a family multiplication strategy (Snooks 1996). The nature of π will depend on the creativity of the strategic decision makers involved, the problems they face and the mix of physical and technical factors available. From this point forward, all discussion of π will be in the context of the contemporary global dynamic strategy of technological change.

It is the spread of the dynamic strategy of technological change from the strategic core that drives the contemporary global strategic transition (Snooks 1999). The global strategic transition (hereafter GST) is the process whereby non- and anti-strategic countries are drawn into the "vortex" of technologically driven economic growth in the strategic core. The advance of the GST brings global output closer to its potential level.

A non- or anti-strategic society is unable or unwilling to unlock the synergy between the factors in the strategy function. Further, the non- or anti-strategic society is constrained by rent-seeking (redistributive) behaviour. Conversely the strategic society is propelled by profit-seeking (surplus producing) activity. Potential output in non- and anti-strategic societies is limited by their call on physical resources, the size of the internal market and a static and low-lying indigenous technological attainment. Potential output in strategic societies has a higher ceiling supported by economies of scale from specialization and servicing a global market, a greater call on resources through the ability to trade and a

productivity premium conditioned by π. In the language of growth accounting, strategic countries will achieve a higher rate of TFP.

3. Japan's strategic pursuit

Japan doubled its share of global output in the three decades from the beginning of the Korean War. Over the same timeframe Japan was able to more than triple its share of global exports. In 1950, Japanese output per worker was just one fifth of the US level. The gap was about to narrow fast. In the ten years to 1960, Japan's labour productivity gap with the United States closed by an average of 1½ percentage points per year. In the following ten years, the gap closed at the accelerated pace of just under 3 percentage points per year. By 1990, Japanese GDP per capita had reached 81% of the US level.[4]

Viewing the Japanese case through the lens of the strategy function illustrates that a combination of strategic leadership, strategic organizations, the utilisation of a backlog of readily attainable technology, ample labour supply and the economies of scale emerging from an aggressive outward orientation can be an expansionary elixir. In short, Japan was a vivid example of the potential benefits to be harvested from discretionary participation in the global strategic transition.

There is a structural break in modern Japan's strategic pursuit. Between the Meiji restoration of 1868 and the end of the Pacific War in 1945, the Japanese state pursued a conquest strategy (Beasley 1987, Gordon 2000). The strategy was manifest in the propaganda slogan "rich nation, strong army" and the rise of the "Black Ocean" (established 1880) and the "Black Dragon" (established 1901) ultra-nationalist expansionist lobbies. Much later, the "co-prosperity" rhetoric was enacted in the same tradition.

Japan's industrialization pattern was inseparable from its conquest strategy. They were mutually reinforcing. Japan's initial success in pursuing a military-industrial expansion path was illustrated by a string of annexations and victorious campaigns in North Asia, Southeast Asia and the Pacific stretching from the 1890s to the 1940s. Japan's resounding victory in the Russo-Japanese war (1904/5) is a true landmark in global history – the defeat of a European power, Russia, by an emerging strategic state outside the European core. The Japanese victory encouraged Britain, the dominant naval power and the state with the farthest flung imperial holdings, to shore up its reciprocal defence arrangements with the Japanese. These arrangements included an assurance that British Singapore would go unmolested. The global balance of power had an upstart new player.

However, unconditional surrender to the Allied forces in 1945, and the subsequent dismantling of the constitutional infrastructure of the militant polity, signaled the exhaustion of this once lucrative dynamic strategy. A new approach was required.

After a short period of stagnation under Allied occupation Japan rose quickly from the mire. The Korean War of 1950 to 1953, with its broad global political implications and the immense procurement demands that sprung from it, was a major influence on Japan's

next strategic choice. Japanese industry, wounded but not wholly incapacitated, bounded back to life. The continuity of the basic elements of the industrial complex pre and post Occupation has been noted by many scholars of firm structure, state-industry relations and corporate governance (Bisson 1954, Hadley 1970, Gerlach 1992, Schaede 1994). Equally, the elite bureaucracy that had so ably steered military-industrial development in practical and ideological terms was still basically intact (Johnson 1982, Gao 1997). In the first four and a half decades of the twentieth century, business and the state were bound together by confidence in the over-arching imperial strategy. In the 1950s strategic confidence would again furnish a state-industry alliance in Japan (McKay 1999). In the latter instance the umbrella strategy was no longer military in nature. The strategy was to enter into the GST, under the technological sponsorship of the United States.

Under this broad theme, the first point of order was to leverage off Japan's existing light and heavy industrial labour force while replacing destroyed and redundant capital stock with the best technology available. The state provided strategic leadership by channeling what was then scarce capital into priority uses that were in accord with the peaceful industrialization strategy (Calder 1993, McKay 1999). The enormous investments this policy accommodated meant that Japan's basic materials industries were able to derive huge economies of scale and establish high levels of international competitiveness.

Japan's downstream manufacturing producers were therefore able to consume competitively priced intermediate goods, helping them to lift their own competitiveness relative to imports and enabling them to build global market share. These foreign exchange earnings (controlled by the Ministry of Finance under surrender requirements at this stage)[5] could then be used to access imported technology. This enabled firms to progressively move up the value chain and increase productivity. As the demands of downstream manufacturers grew, the upstream sector felt comfortable adding even further capacity. This is a clear example of the interaction of strategic leadership and strategic organizations on the demand side unlocking latent potential in the supply side of the economy. It is strategic confidence producing a virtuous circle of self-sustaining economic growth.

The technology required for upgrading the capital stock was easily acquired by import. Much of that technology came from the United States, who felt an economically strong (if militarily emasculated) Japan would become a highly valuable Cold War ally in the potentially volatile north-east Asian crescent (Calder 1995). The majority of Japan's import basket was comprised of capital goods, energy and other raw materials. Japan also paid a large amount of royalties and licensing fees for access to foreign intellectual property. Japan's approach of procuring technology directly, rather than absorbing the large foreign direct investment inflows that would characterize industrialization sub-strategies elsewhere in Asia, is an important point of differentiation. The contrast with China's approach is central to the conclusions eventually drawn.

At this point it is important to differentiate between outward orientation and export dependence. Outward orientation indicates that a priority is given to issues of competitiveness in the tradable sector encompassing both exportables and importables.[6]

External demand is important but domestic demand issues are not neglected. Competitiveness is recognized as vital to generate offshore sales and to compete with and displace imports at home. Outward orientation is reflected in a rising trade to GDP ratio, but the trade to GDP ratio itself need not be high in absolute terms.

In contrast, export dependence is a narrow focus on servicing external demand at the expense of developing the domestic economy. A high absolute ratio of trade to GDP is a necessary but not sufficient signifier. Export dependence manifests itself in a consistent excess of exports over imports and saving over investment. Export dependence leaves economic growth at the mercy of adverse terms of trade shocks, fluctuations in external demand and malignant alterations in the institutional backdrop for international trade.

It is a common misconception that Japan was dependent on export growth through its rapid development phase. That was not the case. The economy was oriented outward but not export dependent. As figure 3.1 illustrates, Japan consistently ran a deficit on its international trade through the 1950s, 1960s and the first half of the 1970s. Japan's national accounts report a deficit on net exports for 87 consecutive quarters from March 1955 to September 1976. Over this period private domestic demand grew at an impressive average rate of 8.8% per annum. Export and import growth were both higher at 13.7% and 13.2% respectively, but the domestic economy was still growing at a much faster pace than the rest of the world. The export share of GDP rose from approximately 3% in 1955 to 8% in 1976. In the same time period the import share rose from approximately 4% in 1955 to 8% in 1976. In other words, Japan's "early strategy" trade deficit of 1% of GDP took two decades to erase. Japan exhibits a clear outward orientation in this period but it was certainly not export dependent.

The fact that Japan's economy was not export dependent does not mean that is was particularly balanced. The supra-normal development of Japan's industrial complex under the broad strategy of outward orientation left other areas of the economy under-developed. Channeling funds to strategic industries on a preferential basis requires another domestic sector (or the rest of the world) to provide funds on a disadvantageous basis.

It is domestic agents under the influence of the strategic leadership that are the only realistic candidates for this funding role. The observed home bias of investors (French & Poterba 1991, Lewis 1999) implies that offshore funding is not to be consistently relied upon to fund a long term strategic imperative. An industrialisation strategy obviously demands that funds be made available to the corporate sector. The household sector, the critical saver and ultimate lender in the economy, is the prime candidate to be 'taxed' to sponsor outward-oriented industrialization.[7]

Marxist scholars have argued that Japan's strategic leadership sided with capital over labour (Takuro 1989). More subtly, it can be argued that Japanese welfare capitalism developed under a system of indirect transfers to labour intermediated by capital (McKay 1999, 2007).

This proposition can be illustrated by an examination of the terms of trade faced by the household and corporate sectors.[8] Tremendous real economic growth in Japan was accompanied by a sustained rise in the aggregate consumer price level. Japanese consumer prices rose at an average annual pace of 5.6% in the 1960s, against a 2.8% average in the United States. Japanese inflation accelerated to 8.9% in the 1970s, against a 7.7% average in the United States. Japan's consumer price level rose by a cumulative 277% over two decades, against a 145% expansion in the United States. So, Japanese firms were able to consistently raise the price of that portion of their output consumed by domestic households.

To proxy the inter-sectoral terms of trade, we can contrast the 5.6% rate of increase in consumer prices in the 1960s to the performance of the producer price level. Producer prices rose just 0.9% per annum in that decade. A huge profit margin for the corporate sector is apparent. The comparable figures for the United States in the 1960s are 2.8% (consumer prices) and 1.7% (producer prices), a substantially narrower margin. Over the two decades from 1960 to 1980 Japan's producer price level rose at an average of 4.0% per annum against a 7.3% lift in consumer prices. The respective US data are 4.8% and 5.2%. Japanese firms were consuming super-normal profits in this twenty year period. They clearly enjoyed substantial pricing power at the retail level: at the expense of households. The combination of external market share gains and a captive home market that expanded relatively rapidly was an immensely profitable combination.

The orthodox theorist may frown at these figures and take them as a sign that aggregate policy settings were imprudent. Yet such analysis is internally contradictory. Mainstream economics at once applauds higher real wages, productivity catch-up and the increased international purchasing power achieved by real exchange rate appreciation, while looking askance at the rate of relative price gains that achieve them. This theoretical curiosity ignores the fact that economies are not immaculately conceived at contemporary living standards.

These contradictions are overcome by the Snooksian concepts (1998a, 1999) of strategic and non-strategic inflation. The former is the result of participation in the "vortex" of the global strategic transition. Strategic inflation is the signaling mechanism whereby strategic pioneers are rewarded and strategic imitators are attracted. Persistent strategic inflation reinforces confidence in the underlying choice of strategy, creating the auto-catalyzing surges in economic growth that characterize the historical record.[9] A deceleration in the rate of strategic inflation can undermine confidence in an existing strategy. Outright declines in the price level may be taken as evidence of malaise beyond the ultimate point of strategic exhaustion. We will return to this final point when discussing the Japanese experience in the 1990s.

Returning to the strategy function, recall that the strength of the vector of strategic inputs, π, conditions the effective deployment of physical inputs, demand for investment, the productive use of the stock of knowledge and the ability to achieve economies of scale in production. The strength of π is in turn a positive function of strategic confidence and strategic inflation.

In Japanese economic history these relationships are illustrated vividly. The presence of strategic confidence among the strategic leadership and the various cluster of strategic organizations was reinforced by the extremely consistent price signal detailed above. That sparked and sustained the process of strategic imitation[10], which encourages the mobilization of more and more capital for the strategic pursuit as societal confidence in the strategy builds. Successful strategists – pioneers and imitators - generated large and consistent surpluses.

4. A technical aside on strategic exhaustion

Outward orientated industrialization was an ideal sub-strategy to exploit the golden years of the 1960s, as Japan's record emphasizes. It obviously functions best against a benign external backdrop. It also demands an ability to develop with the changing demand climate and its concomitant, the retention of competitiveness. These conditions require a great deal of flexibility at the macro and micro level. If flexibility is lost the ability to compete beyond the contemporary product cycle is not guaranteed.

There is the continual danger that outward orientation, which is an auto-catalyzing sub-strategy, may become export dependence, which is not. Outward orientation is an all-encompassing endeavour. Export dependence may result in the siloing of the non-export sector, implying that aggregate productivity growth will lag. This is an enormously important point for the resolution of the core issues under discussion.

Export dependent industrialization is a finite sub-strategy that can exhaust itself – or be rendered obsolete - under a number of circumstances. First of all, a producing country may expand its global market share to saturation point. Crudely, a strategic country can become a victim of its own success. The "saturation point" is the global market share threshold beyond which the producing country can no longer seriously expect to grow its sales at a pace materially different from the rate of expansion of the global market itself. This constraint is only likely to apply to a "mega-state" (Snooks 1998a, 1999, Thurow 1992, Murakami 1996) operating at the technological frontier.

There is a special case of this broad mode of exhaustion. A country below the size of a mega-state may define the technological frontier in its areas of strongest competence and reach a dominant market share in these sectors[11]. If these fields of endeavour represent a large element of the producing country's output, if they slow down, overall growth will also decelerate and confidence in the sub-strategy will decline. A city state pursuing an entrepot sub-strategy in tandem with niche manufacturing and high finance, such as Hong Kong or Singapore, is unlikely to ever reach global saturation point under the general definition. However, entrepot economies, or small open economies with a skewed industrial structure or heavy dependence on a narrow pool of resources could potentially suffer under this special case.

Two, a producing country may lose the competitive advantages that enabled it to pursue a particular style of industrialization in the first place. This may come about for a multitude

of reasons. They include a relative decline in the strength of the producing country's ,rising production costs at home from an uncompetitive non-traded sector, a sustained adverse terms of trade shock, technological innovation in competing locales, a decline in education levels, the rise of a rent seeking elite[12] and a range of potential policy errors. This style of exhaustion will first become evident in a reduced rate of catch-up to the income levels of the leading countries. A sustained and material decline in relative income levels is incontrovertible proof of strategic exhaustion.

There is an important special case of declining competitive advantage. A producing country may have achieved an unnaturally high global market share through a constellation of policies (such as tariffs, subsidies, tax exemptions, opaque quarantine, an under-valued exchange rate, preferential access to finance, preferential procurements, weak internal competition policy and other "behind the border" factors) that it no longer finds palatable at higher income levels. Or its trading partners find the measures increasingly repugnant and eventually offer retaliation. Or their design may be such that they are eventually able circumvented by external and internal strategists, perhaps due to seemingly unrelated policy changes elsewhere that unpredictably weaken the mercantilist apparatus. Removing, by-passing or altering the policy framework that supported the *ex ante* level of market share will see a reduction in market share *ex post*. The *ex ante* sub-strategy can still give way to an alternative that also targets gains in global market share under a more sustainable policy umbrella, but the *ex ante* sub-strategy is exhausted nonetheless. Discretionary reforms of this nature are often difficult to enact due to the contra-strategic incentives of embedded distributional interests (Olson 1982, see note 8).

Three, external events may render the sub-strategy obsolete. If the degree of global openness to trade collapsed for any reason, an export dependent industrialization sub-strategy would collapse. An event that cuts off access to crucial technology or resources for a meaningful amount of time could also have this effect. Cyclical changes in demand do not necessarily undermine an export dependent sub-strategy. A secular alteration in global demand structures is another matter. If the export-dependent country is unable to adapt within a reasonable timeframe, it would enter relative decline.

These issues can be helpfully summarized in diagrammatic form. Consider figure 4.1. The vertical axis measures the world export share of the representative strategic country. Its income level relative to the strategic core is measured on the horizontal. The curve is a path through time. A chronological move to the right along the 45 degree line indicates a rising share of world exports and a narrower income gap.

A country successfully pursuing an outward-oriented industrialisation sub-strategy all the way to membership of the strategic core would be expected to generate a convex curve like that in the diagram.

An export dependent sub-strategy may generate a similar path for a time, or even out-perform it temporarily if external conditions boom. However, an adverse turn of external events will swiftly generate either regression or at best stagnation. Progress on both axes would cease. Depending on the nature of the shock the curve may divert horizontally to

the left (stable export share but relative income decline) or diagonally down to the left (relative decline on both measures). The former situation is actually a special case. It would only result if a shock reduced the sales of all exporting nations with perfect symmetry, keeping market shares stable.

The concept is illustrated further in the three trivariate diagrams that together constitute figure 4.2. The vertical axis represents time and the south-east and south-west axes correspond to the vertical and horizontal axes in figure 4.1. The degree of skew in the triangles shows the bias of the sub-strategy through time.

The strategic administration will perceive any slowdown in export share or the rate of income catch-up. The response is crucial. If the slowdown is perceived to be cyclical, the optimal policy response is to reinforce the secular viability of the existing sub-strategy. Monetary and fiscal stimulus should be used to cushion the system against the temporary shock. That would help ensure that the degree of strategic disinflation is mitigated so as to prevent a damaging negative shock to strategic confidence.

If the slowdown itself is perceived to be at least partially systemic – in other words, it is a lead indicator of future exhaustion – then the conventional counter-cyclical response may not be appropriate. It may be felicitous for the strategic administration to let the strategic disinflation run its course. That will signal strongly to potential pioneers that a replacement sub-strategy is required. An accommodative policy stance that increases nominal inflation will reduce the transparency of the strategic disinflationary signal and potentially create ill-placed strategic confidence. That can eventually lead to outright strategic deflation if false confidence feeds into excessive leverage and a doomed over extension of asset prices.

In an abstract sense strategic exhaustion can be understood as the next observation succeeding the point at which marginal strategic revenues are equated with marginal costs. In other words, the strategy ceases to remunerate its participants, incurring losses while it remains extant. This point is strikingly evident in the history of imperial conquest societies (Snooks 1996). It is equally applicable at the sub-strategic level and therefore to the industrialisation themes that concern this paper. The strategic deflation signal triggered at the point of marginal exhaustion shows no discrimination.

5. Japan's strategic pursuit continued

Japan's strategic outcome initially exceeded the most bullish expectations. Figure 5.1 plots Japan's outward oriented industrialization pattern in the same terms as the schematic diagram presented in figure 4.1. The paired series begin in 1960 due to a lack of data on export shares prior to that year. The data argue that between 1960 and 1973 Japan was the poster child for this particular "path from the periphery" (Haggard 1995).

In the ten years to 1960, Japan's income gap with the United States closed by an average of 1½ percentage points per year. In the following ten years, which comprise the first ten observations in figure 5.1, the gap closed at the accelerated pace of just under 3

percentage points per year. Japan rose from an income level around one third of the US in 1960 to a level of almost two thirds just ten years later. Japan's share of world exports also doubled in this amazing decade.

After 1970 we can see a different pattern emerging. The first half of the decade saw a number of external shocks impinging on Japan's sub-strategy. The collapse of the Bretton Woods exchange rate system and the US dollar devaluation it entailed was a competitive jolt for Japanese producers. The oil supply shock arrived soon after.

What had been an exceptionally benign international demand climate became decidedly fractious. The world economy had expanded at an average pace of 5.2% per annum in the 1960s. The volume of world exports grew even faster at 7.6%. Exports grew by an average of 8.7% in the second half of the decade. In the first half of the 1970s world growth decelerated to 3.6% per annum and world export volume growth decelerated to 5.7%. Export volumes actually declined outright in 1975. They had never expanded at less than a 4% annual pace in the 1960s (figure 5.2).

The stupendous advance of Japan's strategists through the second half of the 1960s (summarized in figure 5.3) was interrupted by the cumulative force of these adverse events. Japan's world export share declined in successive years in 1972 and 1973. The income gap with the United States widened in a material fashion in 1974. Industrial production had increased five fold between 1960 and 1974. It declined by more than 20% peak to trough in 1974/75.

These developments were understandably damaging for strategic confidence. The global terms of trade had shifted radically against resource poor countries. The ample supply of cheap fuel that had been an important source of strategic confidence in energy-intensive heavy industrial development was no longer guaranteed. In tandem with the abrupt decline in the rate of expansion in global demand, the early 1970s asked a severe question of Japan's prevailing sub-strategy.

In the second half of the 1970s and the first half of the 1980s, Japan managed to resume building global market share. The economy also began producing trade surpluses for the first time. However, its rate of catch-up to US income levels slowed to an average of just 0.6 percentage points per annum in the ten years to 1985. In the second half of the 1980s that improved marginally to a catch-up rate of 0.9 percentage points per annum. Neither period came close to replicating the figures of the 1960s.

The move to consistent trade surpluses was enabled by a number of factors. One was the increasing sophistication of Japanese technology. The move up the value-added chain meant that Japanese capital goods and high end consumer durables reached a point where they were reasonable substitutes for American and European imports. As these goods became acceptable as import substitutes they also became potential exports. So Japan began exporting goods they used to import while knocking competitors out of the local market. Indigenous innovations in the manufacturing process and in intra-firm

information flow, well documented in the business literature (Vogel 1979 & 1985, Fuss and Waverman 1992, Aoki & Dore 1994, Tipton 2007), were the finishing touch.

The second factor was that the energy intensity of the Japanese economy had fallen, reducing the import bill for every extra unit of output in the resource poor country. This was achieved through greater efficiency in the use of energy following the jolt of the oil crisis of 1973 and the favourable influence of the increasing importance of the services sector in overall activity. Structural change, energy intensity and emissions per capita are formally related by the environmental Kuznets curve. The argument here is that Japan made discretionary decisions to reduce energy intensity at the same time that developmental gravity was moving the same way.

The third development was that Japanese goods made a social breakthrough with western consumers. In the 1960s the phrase "Made in Japan" was a euphemism for cheap and low quality. Export market share gains were often the result of being the cheapest rather than the best. It took a long time for Japanese goods to lose this stigma. But the fact that the social turning point came when a price advantage was still readily apparent, most visibly in automobiles and electronics, meant that exports were able to maintain a high rate of growth just as imports were slowing for the reasons expounded above.[13]

Fourth, a sharp decline in the investment to GDP ratio from 36.5% in 1973 to 30.5% in 1978 was not matched by a similar drop in the savings rate. Domestic savings to GDP fell from 1973 to 1975 but stabilized between 32½% and 33% of GDP for the next three years. Three decades before the term "savings glut" entered the policy lexicon in the post Asian Crisis world (Bernanke 2005) Japan was pioneering the concept.

A "savings glut" derived from a step decline in the investment share and resilient savings is a strong indicator of a decline in strategic confidence. The forces at play are centrifugal. Lower strategic confidence drives a reduced expectation of future returns to capital. This feeds directly into a higher rate of precautionary savings by households. Furthermore, firms increase their own savings rate by retiring debt rather than accumulating it. That impacts on their employment plans, which undermines household confidence further, which generates a further round of precautionary savings. Indeed, conceptually one might think of changes in strategic confidence as the savings and investment equivalent of the non-linear financial accelerator of mainstream macroeconomics (Bernanke et al 1996).

As stated above, Japanese gross fixed capital formation peaked as a share of GDP in 1973. It has been in trend decline since, even when the late 1980s bubble period is taken into account (figure 5.4). Unsurprisingly, capacity utilization rates in the manufacturing sector also peaked around this time. This major shift in the demand for capital investment initially reflected a loss of short term strategic confidence. It eventually developed into an extremely painful episode of strategic exhaustion, policy error, failed adaptation and strategic deflation.

The first and third factors relating to the move to trade surplus – the move up the value chain and the social recognition of Japanese goods - point towards a continuation of the outward oriented strategy. However, the optimistic argument must be balanced by the fact of the decline in the investment share of income from 1973. This under-utilization of the national savings supply was underpinning the surplus at the aggregate level and is potentially indicative of export dependence.

In the 1970s a degree of ambiguity began to attach itself to Japan's outward oriented sub-strategy for the first time since its enactment. On the positive side formidable strength was apparent in the rise of a critical mass of Japanese multinational firms. These strategic organisations, many of whom were beneficiaries of preferential treatment in the early stages of the post war strategic pursuit, achieved global relevance in a number of major industries. These included steel, shipbuilding, automobiles, office machines, consumer electronics, microelectronics, general machinery, non-ferrous metals processing, chemicals, precision instruments, financial services, trade facilitation, construction, infrastructure, energy – just about everything outside of defence and aerospace. They had physically out-grown state sponsorship and chafed at the continuation of bureaucratic oversight. With a global demand base, an increasingly international production base and the ability to tap offshore capital markets for funds, an alliance with the state became increasingly irrelevant to these firms.[14]

The non-traded sector was a different story. It was argued in section 3 that the inter-sectoral terms of trade between firms and households was strongly in favour of the former through the 1960s and 1970s. The bureaucracy chose to subsidise outward oriented industrialization by suppressing returns to domestic household savers. This episode of a developmental state "getting the prices wrong" [15] was pro-strategic. In the 1970s another inter-sectoral subsidy was implicitly sanctioned. The subsidy ran from the competitive, high productivity portion of the economy to the uncompetitive, low productivity segment. This subsidy was clearly contra-strategic being inherently a matter of distribution rather than surplus generation.

The uncompetitive portion of the economy was comprised of labour intensive industries in the traded sector that were past their competitive peak (e.g. textiles) but refused to go quietly; industries that were internationally competitive but had been suddenly saddled with excess capacity due to a decline in external demand for their output (e.g. shipbuilding); industries coddled by high levels of effective protection (e.g. agriculture) and industries with a degree of natural protection where domestic competition was at best soft and at worst corrupt (e.g. construction).

For the competitive portion of the economy this sponsorship meant higher direct and indirect input costs, a larger tax burden and greater competition for capital, labour and resources than would otherwise have been the case. The response of the competitive sector was to move production facilities offshore. At home they were being asked to shoulder the burden of the weak. The contrast with the lure of cheap labour costs, tax concessions and other forms of preferential treatment available to the foreign direct investor in ambitious emerging economies was stark. As productive capacity moved

away, the proportion of the domestic economy accounted for by lower productivity elements rose.

The expanding presence of these lower productivity elements in the economy was a drag on overall competitiveness. At the same time, the large companies did even better in overseas markets as they lowered costs through the hollowing out process, setting up integrated production chains along the Asian Pacific rim (Hatch & Yamamura 1994, Tipton 2007: 57-61). They also rapidly increased their brand recognition with western consumers. "Made in Japan" had morphed from cheap, to reliable to superior.

The conventional history of the creeping development of the "dual economy", particular in the context of industrial adjustment, is substantial (Katz 1998, Uriu 1996, Samuels 1983, Calder 1988). As noted above, the negative impact of the two-track economy upon productivity, in tandem with the less supportive international backdrop of the 1970s and 1970s, saw Japan's rate of catch-up to US income levels slow to an average of just 0.6 percentage points per annum in the ten years to 1985.

In the second half of the 1980s the rate of catch-up improved marginally to 0.9 percentage points per annum. While no period after 1973 came close to replicating the figures of the 1960s, to the outsider it must seem curious that Japan was able to accelerate its rate of catch-up after 1985 despite the substantial headwinds of the hollowing out of manufacturing and the impact of the post-Plaza Accord yen appreciation. Indeed, this could be interpreted as a signal that a sub-strategy that appeared to be tiring had gained a second wind.

It is instructive to again turn to the scatter plots. To aid the analysis we have broken the sample down into distinct phases and zoomed in to magnify the observable trends. The decade to 1985 (figure 5.5) shows mixed returns to the outward oriented sub-strategy. Besides the gains made on both axes from 1979 to 1981, the results would have been poorly predicted by a model capturing the dynamics of the relationship in the prior phase (figure 5.3). It is clear that cyclical factors began to impinge more regularly on secular dynamic forces. The impact of US economic recession (strong catch-up for Japan) and the Reagan fiscal expansion and strong dollar policy (better Japanese exports but more impressive US income growth) can be easily seen in the data.

After 1985 a new trend became apparent. The G5 Plaza Accord of that year ushered in a protracted era of a weaker US dollar, and its corollary, a stronger Japanese yen. This completed the long process of yen appreciation from its fixed rate of 360 to the dollar under Bretton Woods to a level more in line with its theoretical equilibrium level (figure 5.6).[16] The violent US dollar depreciation of 1985 had a major impact on Japanese export market share. Japan's share of global exports fell from 9.6% in 1985 to 8.8% in 1986, 8.2% in 1987 and 8.0% in 1988, after which it stabilized just over 8%.

This deterioration in market share could be interpreted as sign of the unwinding of a pro-strategic policy framework that had supported an unsustainable level of market share. This potential mode of strategic exhaustion is discussed in section 4. However, there was

as yet no sign of exhaustion in Japan's relative income growth. Figure 5.7 is very clear. Despite the decline in export share Japan made good progress towards improving its relative income status. This was a strong signal to strategic agents that the sub-strategy continued to be viable.

The strongest signal observed by strategic agents was a rapid rise in domestic asset price inflation. The compounding wealth effects of asset price gains were a major contributor to the acceleration in income growth that enabled an enhanced rate of catch-up in the late 1980s. Strategic confidence boomed. The investment share of GDP began to rise again, breaking out of its long decline from the 1973 peak (figure 5.7). The performance of the major asset classes are illustrated in figure 5.8. These data describe one of history's great bubbles.

With hindsight, it is obvious that a dominant portion of the asset price signal was of the nominal, as opposed to the strategic, variety. Figure 5.9 plots the policy interest rate, the growth rate of nominal GDP and the ratio of growth rates of domestic credit and GDP. A strategic administration should use monetary policy to limit fluctuations in non-strategic or nominal inflation so that the strategic inflation signal is transparent. In Japan in the second half of the 1980s, an excessively easy liquidity environment multiplied the rate of nominal asset price inflation, sending a signal to agents that they interpreted incorrectly. In other words, the strategic confidence of Japanese agents was cumulating powerfully on the basis of *faux* strategic inflation that was in reality the result of a monetary policy error.

The strategic administration obviously did not recognize the impending exhaustion of the prevailing sub-strategy. They may have felt that the decline in export share after 1985 was a temporary exchange rate driven phenomenon that should be offset by easy domestic monetary conditions. They would have seen the narrowing of the income gap as a robust justification of their policy stance. Certainly they were not under any pressure to do otherwise. The hubris and general air of triumphalism that arose in the public commentary of the time is testament to that - including the growing cohort of western academic cheerleaders.

The degree of financial leverage that usually goes along with a major rise in strategic confidence makes a false asset price signal particularly damaging. The unwinding of nominal asset price inflation when the bubble eventually burst left Japan with a balance sheet problem of enormous magnitude. During the bubble the corporate sector had accumulated immense liabilities against their rapidly increasing net worth. The banks providing the funds felt that the collateral was ample. Households felt vastly secure in their employment status and were comfortable taking out mortgages to fund property purchases at valuations that implied extreme ratios to average income levels. Strategic confidence in a false paradigm built a castle on the proverbial swamp.[17]

As emphasized above, strategic confidence is a momentum variable. Strategic confidence runs from pioneers (who initially respond to a price signal) to imitators in a self-sustaining, compounding fashion. When the price signal turns, strategic confidence can

unwind swiftly. The transmission mechanisms of a system wide decline in strategic confidence are extremely difficult to arrest with conventional policy tools. In Japan's case, monetary policy became impotent as demand for credit evaporated. Corporate Japan entered upon a decade of de-leveraging, shifting from a net 'flow' borrower of more than 10% of GDP in 1990 to a substantial net lender (figure 5.10, Koo 2003). Unsurprisingly given this backdrop, the investment share re-entered the downtrend first sighted in the middle 1970s. Strategic confidence giveth and it taketh away.

With the nominal inflation signal of the bubble years stripped away, a sustained strategic deflation of asset prices commenced. The strategic outcome through the 1990s was unambiguous testimony that the sub-strategy of prior decades had exhausted itself. The scatter plot tells the story (figure 5.11). Japan's performance on both axes regressed through the 1990s. With no alternative sub-strategy in place, and a lack of flexibility that would have enabled a quicker work-out of the balance sheet problems bestowed by the 1980s, Japan moved assertively backwards.

Just when the sub-strategy of outward orientation exhausted itself is not precisely clear. It was certainly no earlier than 1973 and probably much later. It was definitely no later than 1990 and probably earlier.

The Plaza Accord of 1985, where the G5 nations agreed to address the over-valued level of the US dollar through coordinated interventions, and the Louvre Accord of 1987, when the same nations worked to stabilize the dollar, are key milestones. The former removed one pillar of Japan's external strength: an undervalued exchange rate (figure 5.6). The latter encouraged the Bank of Japan to run an even easier monetary policy than they might have otherwise (figure 5.9), to counter expectations of further US dollar depreciation in the foreign exchange market. This exacerbated the problem of the false strategic signal emanating from the nominal inflation of domestic asset prices. This also temporarily delegated the major burden of real yen appreciation to the relative price level rather than the nominal exchange rate.

Recall from section 4 that an export led strategy can exhaust when a constellation of policies supporting an excessive global market share are unwound. It would be hugely unfair to dismiss Japanese export market share gains over many decades as no more than the result of modern day mercantilism. However, it is difficult to escape from the fact that from the point that ambiguity began to enter the Japanese strategic picture, loosely dated from the middle 1970s, policy was effectively shielding agents from a pure reading of strategic prospects.

This policy response displayed a clear misunderstanding of the fundamental concept of strategic confidence. The correct role for a strategic administration is to nurture confidence in viable sub-strategies through a supportive regime. This involves both counter-cyclical and pro-structural policy. However, when the lead indicators of strategic exhaustion become evident, counter-cyclical monetary policies may hurt the strategic outcome in the long run. If monetary easing maintains confidence in a soon-to-exhaust strategy, then the administration is committing a major policy error. If a *faux* signal of

strategic dynamism is communicated the incentive for pioneers to adopt alternative strategies is dampened when the need for innovation and experimentation is greatest.

The failure of the Japanese administration to provide strategic leadership at this moment of intense national need is extremely conspicuous. Rather than allowing a strategic disinflation to unfold unfettered, the price signal was distorted until it was too late to adapt. The initial error was compounded by a sharp monetary tightening in 1989 and 1990, which pricked the bubble, unleashing pent-up strategic deflationary forces over the entirety of the next decade.

The wealth destroying decline in the Japanese price level observed over the last fifteen years is unambiguous evidence that the sub-strategy that had served it well previously had nothing left to give. The failure of the strategic administration to provide the right sort of leadership through the 1980s was immensely damaging – to the confidence of strategists and the welfare of succeeding generations.

6. China's strategic pursuit

China's pursuit of an outward oriented industrialization sub-strategy is dated to the pro-market reforms of 1978. The economy has expanded at an approximate real pace of ten percent per annum over the three decades since. The headline data that describe the Chinese experience are broadly similar to those of Japan and the smaller economies in the region that have embraced a sub-strategy of outward oriented industrialization.

Below the surface there are major differences within the East Asian experience. These are brought out in a succession of excellent area studies (Johnson 1982, Amsden 1988, Wade 1990, Garnaut & Huang 2001) and comparative works (Deyo 1987, Amsden 2001, Haggard 1996). Each national sub-strategy may be regarded as *sui generis*. However, it is not difficult to argue that the national deviations we observe across East Asia are from a central outward oriented strategic tendency.

There are a number of basic points of contrast between the pioneering path of the Japanese and that paved by China. China began its pursuit in 1978 at a much lower relative income level than the Japanese in 1950. Even today, China is still a low income economy. Two, China originally engaged with outward orientation after thirty years of socialist planning marked by pervasive state ownership of the production and financial complex. Japan had a continuous tradition of private capitalist enterprise in both production and finance. Three, China entered into its sub-strategy with deep rooted mistrust underpinning its relationship with the strategic core. That compares to the outright sponsorship of Japan by the United States. Four, China has embraced foreign direct investment as its core method of attracting technology. Japan has preferred its firms to buy technology, create indigenous competency and learn to compete via innovation. Five, in Japan labour was a scarce resource for most of its high growth era. China, by vivid contrast, has been in a position of constant labour surplus in its rural hinterlands. At times China has suffered from large scale unemployment due to the enactment of strategic change.

Figure 6.1 illustrates the contours of China's strategic pursuit since 1978. The data are equivalent to those presented in the Japanese context above. The most obvious point stemming from figure 6.1 is that China's strategic pursuit is showing no sign of exhaustion after a quarter of a century. Indeed, China has accelerated its rate of income catch-up in the recent past, while making strong gains in global market share.

Taking this observation as a starting point, what can be reasonably inferred about China's future strategic outcomes from a combination of the theory outlined in sections 2 and 4, the Japanese experience as detailed in sections 3 and 5 and a balanced reading of China's own fundamentals?

Figure 6.2 divides China's strategic pursuit into three time periods. They are 6.2.i, 1978 to 1990; 6.2.ii, the 1990s; and 6.2.iii, 1999 to the present. The first panel shows a short, sharp increase in global market share as China initially engaged with the world. However, China's market share was basically stagnant for the remainder of the period. Despite this failure to build on the initial surge in relative export growth, China managed to narrow its income gap to the United States in ten of the twelve years in the sample. This data argues that while China's strategic leadership provided a clear "look outward" signal from 1978, the majority of its successes in this period came from sources other than export growth.

Moving forward to the 1990s, a similar picture emerges. China continued to make striking gains in relative income terms, but its ability to gain export market share in the first half of the decade was rather mixed. Indeed, a home grown investment bubble in 1992/94 and the consequent hard landing, which overlapped with the Asian Crisis slowdown, were the main swing factors in Chinese economic performance in this decade. The gain in export market share in the late 1990s should be viewed as a function of domestic excess capacity – a corollary of an internal demand shortfall - rather than any new-found comparative advantage.

So, for the first two decades of China's sub-strategy of international engagement, the evidence states that export growth was an important but far from paramount factor in the achievement of strategic outcomes.

In the most recent sample, covering 1999 to the present, there is a striking change. Suddenly we observe global market share doubling within the space of a few years. This trend and its concomitants *viz.* a sharp rise in the export share of GDP and an alarmingly swift widening of the trade and current account surpluses, has encouraged many observers to proclaim that Chinese growth is export dependent. If this were the case, then the theory in section 4 implies that the Chinese model is highly vulnerable to a catalogue of potential shocks. That being the case, it is crucial to stress test the "export dependent" proposition before we proceed any further.

The orthodox way of measuring external focus is to scale exports by GDP. Chinese exports are equivalent to approximately 40% of GDP today. That compares to a level

close to 20% in 2000. Exports have grown approximately three times faster than GDP in that period. The contribution to growth from net exports has risen also, but not by as much as might be deduced from the rapid rise in the export share (figure 6.3). The reason net exports have been somewhat becalmed – at least until very recent history - is that the import share of GDP has also been rising much more sharply than in previous periods. This is a function not only of China's well documented appetite for energy, food and metals imports (Garnaut & Song 2006b, McKibbin 2006, Chen 2006, Song & Yu 2007), but also China's now dominant role as the final assembler of goods whose components are produced elsewhere (Athukorala 2005, Li *et al* 2007).

Li *et al* (2007) present a wealth of data on China's historical and contemporaneous place in cross-border manufacturing chains. Between 1992 and 2005, parts and components grew from 16% to 35% of China's total manufacturing imports. Over the same period the global share of parts and components in total manufacturing trade has increased from 21% to 26%, implying that the growth in China's assembly sector is extremely dynamic.

China's role as the assembler of first resort in the Asian production chain, which has accelerated in line with the sharp increase in foreign direct investment following the WTO accession in 2001 (Chen 2007), has contributed heavily to the over-estimation of the export sector's true impact on the economy. Where trade fragmentation is present on a substantial scale, export to GDP ratios are a very crude and potentially misleading metric.

Comparing a gross concept (export sales) to a net concept (GDP as the sum of added value) is likely to overstate the importance of the former when the import component of exports is high or the goods are merely being trans-shipped through a territory.[18] Small outward looking economies such as Singapore, Hong Kong and Malaysia feature export to GDP ratios above 100% - an intuitively awkward result. What we should be doing is calculating value-added directly attributable to the export sector and scaling that amount by GDP. One such exercise (Anderson 2007) shows that by controlling for the import and extra-sectoral domestic content of export production, export value-added currently accounts for no more than 8% of Chinese GDP, up from around 5% at the turn of the century.

Foreign direct investment (FDI) inflows have been substantial and consistent since the early 1990s, ranging from a low of 2.6% of GDP in 2006 to a high of 5.8% of GDP in 1994.[19] The sectoral composition of inward FDI has reflected the strategic leadership's dual focus on procuring technology and utilizing its comparative advantage in labour intensive products. An increased emphasis on attracting inflows in higher value-added sectors has been particularly noticeable since the WTO accession. This has manifested itself in an apparent increase in the sophistication of China's export basket (Rodrik 2006).

The share of China's exports accounted for by electrical machinery and automatic data processing equipment has risen from just over 7% in 1994, to 18% in 2001, to 24% in 2006. The share of apparel exports has gone in the other direction: from 20%, to 14% to 10% (figure 6.4). Anderson (2007) argues that the import content of labour intensive light

industrial exports such as apparel averages just over 30%. In electronics, import content is currently around 70%, and was as high as 95% at times prior to WTO. The conclusion is straightforward. By changing the structure of its exports, as illustrated by this simple two sector example, China has raised the import content of its exports and by definition has lowered the domestic content. This is contributing to an unusually large spike in China's apparent share of global exports, and is vastly overstating the importance of the export sector to the local economy.

A final illustration of this point is that foreign funded enterprises have become increasingly important in the export and import sectors, consistent with the impressive stock of traded sector FDI that has been accumulating over the last decade and a half. Figure 6.4 shows the consistent increase in the share of exports accounted for by foreign funded enterprises. Foreign firms started from a higher base on the import side, but they have still managed to expand their share consistently so far this decade.

This finding can now be related back to the apparent surge in China's share of world exports that originally sparked comment in relation to figure 6.2.iii. Presenting the global export shares in raw form, and adjusting for the activities of foreign funded enterprises, China's strategic pursuit since the late 1990s is re-cast in figure 6.5. When the exports of foreign funded enterprises are removed from the data the nature of China's strategic footprint looks remarkably different. The argument that indigenous Chinese firms are highly leveraged to external demand looks like nonsense based upon this re-statement. While it is obvious that some of the income catch-up is also attributable to the activities of foreign firms, any reasonable discount factor we could apply would not alter the basic picture. Since the late 1990s, China has narrowed its income gap with the United States consistently, while increasing its adjusted global export share in less spectacular fashion. These observations are indicative of outward orientation and are far from meeting the thresholds for export dependence.

Having dealt with the issue of export dependence, we can re-focus on the forward looking analysis. Recall functions (1) and (2) from section 2 above. They argue that the strategic outcome, GDP, is related to the dynamic interplay of the available physical factors, the stock of technology, scale economies and a vector of strategic factors. Physical factors are endowments with gradual and predictable development paths; technology is dependent on both the internal and external state of knowledge; scale economies are related to demand (market size) and supply (investment to meet said demands); and the key strategic factors are ideas, organizations and leadership.

Dealing with the most straightforward element first, China's outward oriented industrialization strategy will continue to benefit from the absorption of foreign technologies. China's productivity level[20] was just 5½% of the United States' in 1978. China's relative productivity level rose to approximately 16¼% by 2006. Figure 6.6 shows that Japan began its rapid period of 'catch-up' at a relative productivity level closer to 30%. This enormous productivity gap implies that China will retain the "advantages of backwardness" (Gerschenkron 1962) for a substantial period of time measured in decades not years. The periphery beginning to engage with the strategic

core, and raising productivity levels thereby, is central to the "global strategic transition" of Snooks (1999).

China's strategic administration has recognized the value of imported technology and has established a welcoming attitude to FDI at all levels of the manufacturing value chain. Openness to such flows is an illustration of the obvious fact that China is participating in the global strategic transition in part due to a discretionary decision of the leadership. Changes in the FDI policy regime over time have sought to increase the sophistication of inflows, as documented above with reference to export structure. This guidance from policymakers has compressed the timeframe in which positive strategic structural change might have taken place otherwise.

In addition to the productivity benefits of introducing better technology to workers already in the formal productive sector, China is promised additional stimulus from the urbanization process. When it is explicitly accounted for, rather than subsumed in the total factor productivity residual, growth accountants argue that the urbanization process has directly contributed between 1 and 1½ percentage points of Chinese annual output growth since 1999 and approximately ¾ of a percentage point between 1978 and 1998 (Wang 2007, He et al 2007, He and Kuijs 2007, *Cf* Qiu et al 2006, Perkins and Rawski 2007).

Projections by the United Nations (2005), summarized in figure 6.7, argue that this particular source of support for the current sub-strategy will remain in place, once again, for at least a decade. The UN's demographers assume that China will achieve the projected global average rate of urbanization by 2030. Using the UN figures, Wang argues that urbanization will continue to provide more than one percentage point of growth annually to 2020 (figure 6.8).

There are currently two major impediments to the rural/urban labour transfer proceeding in linear fashion towards global norms as envisaged by the UN. The first is the *hukou* system of household registration. Under *hukou*, China is perhaps the only country that actively discriminates against its internal migrant workers (Meng 2000, Knight and Song 2001, Du et al 2006). The main form of discrimination is the withholding of the social security benefits that are freely available to registered urban residents. By staying in their place of registration workers can maintain their call on benefits. This is one reason why the rate of Chinese industrialization has outpaced urbanization by a substantial margin up to this point.[21]

Further impediments to a more rapid rural-urban labour transfer are the fundamental issues of property rights, land tenure, transfer and use. One informal estimate puts the nationwide proportion of land use that is technically illegal as between 60% and 90%.[22] The inability of peasant farmers to sell or lease their land – if land is left unattended it will be appropriated under opaque compensation arrangements – makes the relocation decision a more complex calculation than the rural/urban wage gap make it appear on the surface. Local and county government corruption, rapacious developers and the

administrative incentive to skew land use to maximize revenues all contribute to a general reluctance to leave land unattended.

The Chinese administration clearly recognizes that urbanization will be a vitally important contributor to the nation's strategic outcome. To that end, policy experiments related to land transfers (Guangdong in the Pearl River delta) and *hukou* reform (Chongqing and Sichuan, contiguous regions in central China) are underway. Assuming that these experiments are implemented successfully, and gradually introduced elsewhere, it is reasonable to infer that the urbanization trend will enhance Chinese strategic outcomes for some time yet. Indeed, the current material constraints on internal migration have suppressed the supply of workers. This pent-up supply of labour can be released in a reasonably controlled fashion at a time of the administration's choosing by the policy adjustments sketched above.[23]

Urbanisation will also create net new demand for dwelling units and associated infrastructure. The national average number of persons per household was 3.2 in 2006. Households in Beijing and Shanghai, the two largest cities, are much smaller at 2.6 and 2.7 respectively. Under these parameters we can do a quick back of the envelope calculation. The 420 million or so internal migrants expected by 2030 will require 158 million dwellings, versus the 131 million (a higher end estimate) they have left behind. That implies a significant long run investment in the dwelling stock that will support a high rate of capital formation for a long time to come.

In outright terms, the contribution to potential supply from an expanding labour force and a declining dependency ratio will remain positive until the half decade of 2015 to 2020 (Golley and Tyers 2006, Perkins and Rawski 2007). China's demographic transition[24] has been accelerated by the twin forces of the one child policy and the second generation shadow of the disastrous famine produced by the Great Leap Forward of the late 1950s. In the absence of a change in participation rates or immigration flows, at this point the direct contribution to growth from this angle will slowly decline. Golley and Tyers (2006) argue that a rise in aged participation rates has the potential to substantially mitigate the negative impact of the lower rate of new entrants predicted by the observable demographic profile. The rate of labour force participation of various age cohorts can be manipulated by targeted fiscal measures. China's strategic administration has every opportunity to prepare for this impending stagnation in labour force growth by managing the participation incentive matrix for older workers. China's ageing trajectory is summarised in the two panels of figure 6.8.

The identification and exploitation of scale economies is a robust element of China's current sub-strategy. The enhancement of scale economies will be a major contributor to the success of its future path. In direct contract to the sequence of development in the United States or Germany, China has made greater gains in accessing external scale economies than in integrating its domestic markets. Market segmentation studies that attempt to quantify growth spillovers and the co-movement of cycles across Chinese provinces show only modest evidence of intra-national integration (Groeneweld et al 2006, Golley and Groeneweld 2007).

At a more practical level, it is possible to construct proxies of market integration from detailed logistics data. Figure 6.9 shows the ratio between the average growth rate of GDP and the average growth rate of the volume of various forms of freight for the period 2001 to 2006. The freight categories and their ratios to GDP growth (Δfreight/ΔGDP) are road 0.6, rail 0.8, air 1.1, ocean going (1.5) and river going (0.9). Predominantly domestic logistics (road, rail, and river) have all grown at a slower pace than overall GDP. Predominantly international logistics (air and ocean) have grown significantly faster. These data offer micro support for the thesis that China's internal markets are weakly integrated. Further, the data argues strongly that integration with external markets is expanding extremely rapidly. This last point is consistent with the spectacular lift in China's share of world exports, the role of the component and assembly trade in this phenomenon (which by its nature amplifies freight volumes), and China's rapid rise to a paramount position in the global energy, food and resources trade.

The currently low level of domestic market integration offers China a clear opportunity to alter strategic course when the stimulus to growth from technological catch-up, urbanization, demography and external demand begin to diminish. With a population that the UN projects will touch 1.45 billion in 2030, 60% of whom will live in urban settings, with 86% of these expected urban households ranked as "middle class" or "affluent" (Farrell et al 2007, figure 6.12) it is entirely logical that the administration will increasing look to internal economies of scale to drive the industrialization sub-strategy.

One channel that the strategic leadership should focus on to guide this change is the level of the savings rate. In the Japanese context, it was possible to trace the state of strategic confidence through the trend in aggregate savings and investment. When Japan's outward oriented industrialization strategy first began attracting doubters in the middle 1970s, we saw an asymmetric response emerge. Investment rates declined but savings were resilient.

In China we have seen a fascinating savings and investment response in recent years: a rise in both measures to levels unheard of in other large economies. The rise in savings was initially a rational response by households to the loss of security brought about by the lift in unemployment that was created by state owned enterprise restructuring (Huang 2001).

In the current decade, with millions moving above subsistence income levels, enormous numbers of households made a decision between saving and consumption for the first time. Under these circumstances a bulge in the savings rate is to be expected. With that in mind we might attribute a portion of the rise in overall savings to the increased security that has come to many households who are producing surplus income for the first time. These are the households formerly ranked as "poor" who have transitioned to "lower middle" in figure 6.12. This factor will remain a support for the savings rate out to the horizon.

Since 2003, which marks the beginning of current growth acceleration, an increase in corporate profits has contributed to a sharp rise in gross corporate savings. Gross national savings have increased to more than 50% of GDP, accommodating an investment rate that has risen to and sustained itself well above 40% of GDP. In 2006, the gap between the two - the current account surplus - widened to 9% of GDP. In 2007, a result closer to 12% is likely (Figure 6.13).

Conventional economic wisdom, encapsulated by the Solow-Swan growth model (Solow 1956, Swan 1956) and the convergence thesis (Abramovitz 1986, Baumol 1986, Dowrick & Nguyen 1989) argues that low income countries should run current account deficits through their catch-up phase. These deficits are to be funded by high income countries that are in turn advised to run current account surpluses. The relatively high rate of return available when capital intensity is low offers the price signal to achieve the desired direction of flows. At the same time, low income countries are reminded of a binding external financing constraint should any number of levered projects go awry.

China has ignored these conventions by generating excess savings despite also sustaining an investment boom. This savings surplus creates great opportunities for China outside of the obvious release from the external financing constraint that dogs many low income countries. The savings buffer implies that Chinese agents could increase their consumption by 9% of GDP without compromising funding for the investment projects of strategists. The virtuous circles of expansion that would emerge from a step increase in consumption are obvious. Considering the scale of the potential opportunity, a strategic leadership observing the current state of affairs is bound to design a policy framework that will create the correct incentives for a reduction in savings. A greater level of strategic confidence must be ignited in China's households.

The obvious policies to pursue regarding household savings are those that reduce the direct burden on current and future household income. The cost of education, the cost of health care, the cost of acquiring real estate and the cost of a self-funded retirement all loom large in the thinking of Chinese households (Lane & St-Maurice 2006). A decent social safety net, greater access to improved public health and education and a modern and competitive financial system would tackle these disincentives to consume current income directly.

A modern and competitive financial system would also help to reduce excess corporate savings. State owned enterprises have preferential access to bank finance in China for a number of historical reasons (Huang 2001). The more dynamic non-state sector, particularly small and medium sized firms, are clear outsiders in the credit allocation process. The non-state share of gross output has risen from 22% in 1978 to 69% in 2005. These firms are forced to rely predominantly on retained earnings for investment, which in turn demands that they save more than their state-owned counterparts. Encouraging banks to allocate credit on commercial terms at arm's length will surely help reduce the savings rate among China's dynamic non-state enterprise cohort. The further and highly tangible benefit of more efficient capital allocation – in line with strategic price signals - would also arise from financial system reform (McKinsey 2006). The introduction of

foreign banks into domestic banking business in late 2006, the growing number of initial public offerings of former state owned banks and the proliferation of foreign institutions taking non-controlling stakes in Chinese banks all speaks of an increase in competition.

More efficient financial intermediation would also improve the rate of return on household savings. Weak returns on the savings stock puts a great onus on maintaining the flow of savings at a high level. Various generations of Chinese administrators have suppressed rates of return to household savings to subsidise the cost of capital to the productive sector. Following the end of the inflationary boom of 1993/94, a huge number of bad loans engulfed bank balance sheets. This encouraged the administration to further suppress returns to savers by keeping deposit rates low to pad bank lending margins while they slowly clawed out of the bad loan black hole.

A policy to deregulate interest rates, allowing strategic price signals to operate with respect to savings decisions, would be a very constructive reform. Households have shown a willingness to respond to price signals when the ability to change asset classes is available. The sharp rise in the Chinese equity market in 2006 and 2007 has been intimately associated with a diversification of household assets away from bank deposits. To a lesser degree, a shift from foreign currency to local currency deposits is underway, as the newly flexible renmimbi has made consistent (if moderate) gains against the US dollar.

To encourage the state-owned firms to save less, the government has announced that they will be required to pay dividends for the first time in 2008. This will not only encourage state firms to reduce their savings, it will empower the central government to re-distribute these funds to areas that might impact positively on household sentiment. A strategic leadership with a starting point of surplus private savings is in prime position to design incentives that actively unlock synergies across the strategy function.

7. Counter arguments to the benign China scenario

To this point the argument has been very constructive regarding China's strategic prospects. The current mode of outward oriented industrialization should be well supported from a number of angles for at least the next decade and probably much longer. The contours of a replacement strategy are already clearly observable, with latent future growth evident in the exploitation of internal economies of scale, reform of the financial system and a large rise in the private propensity to consume that need not penalize the current rate of fixed capital formation.

Against this backdrop it is difficult to picture a scenario where China will experience a Japanese style exhaustion of its industrialization strategy within the scope of a couple of generations. However, this benign view ignores a number of legitimate risks that could undermine Chinese industrialization under either an outward oriented or internally focused sub-strategy.

This catalogue of potential risks include internal resource and environmental constraints; the lack of an indigenous innovation infrastructure; reduced access to foreign technology for political reasons; reduced access to foreign resources for political reasons; and potentially destabilising military conflict as demands on the global resource stock intensifies. We consider the first two points in detail below.

The environmental externalities of Chinese growth are attracting increasing interest (Smil 2004, Economy 2007, Song 2007b, Qun & Peng 2006, Diamond 2004). China presently suffers from a collection of self-created pollution maladies, impacting broadly upon air quality and land and water quality and availability. China's ability to independently feed itself is long gone; deforestation, over-grazing and over-cultivation is degrading the landscape; severe water scarcity threatens a number of northern cities; water quality is heavily compromised by sewerage and industrial wastewater; and a reliance on coal for burgeoning energy needs has created pervasive air quality issues.
As China converges to a more mature energy consumption model it will put greater pressure on the environment as it rapidly increases its volume demand for fossil fuels.[25]

The strategic leadership recognizes that the country is on an unstable environmental course. In response, the *National Assessment Report on Climate Change*, summarized in Song (2007), offers a course of action to stabilize and then reduce emissions. Much of the work is expected to be done by the developmental gravity of structural change. The optimistic view of emissions control is encapsulated by the empirically documented "environmental Kuznets curve" (Qun & Peng 2006). Faith in on-going technological progress underwrites the overall assessment regarding emissions.

The problem of water scarcity has no ready made solution, in theory or in practice. The official forecast is that the country's water resources will decline from around $2220m^3$ per capita in 1997 to $1760m^3$ per capita in 2030. That is just above the formal threshold for being classified as "water poor" (Song 2007).

China's current per capita endowment of arable land, water and rainfall are shown in a comparative setting in figure 7.1. These variables are shown in concert with two energy related metrics. The "global norm" (the regular pentagon) is the average global endowment in each category, which forms the base for the national indices, which in turn comprise the irregular pentagons. In per capita terms, China is very poorly endowed with water, arable land and rainfall relative to other large, populous nations. Outside of thermal coal, China is also well short of self-sufficient reserves in metals and fuel supply, even at low per capita consumption rates. China will have to surmount these deficiencies through innovation if its industrialization is to continue apace.

Under the existing governance structure any effort to coordinate an economy wide reduction in emissions, or to encourage more efficient resource utilization, is bound to fall on fallow ground. In contrast to the strong central apparatus of the Japanese state, China's national leadership must rely very heavily on local government officials to carry out central directives on the ground. An incentive gap between the capital and the provinces, coupled with the difficulties of surveillance and enforcement in as large and

diverse a country as China, often prevents Beijing's best intentioned policies being enacted. Critically, lending decisions by the state run banks are brokered at the local level.

Local officials often find that their own incentives (maximizing tax revenues, securing their own fortunes, surpassing central growth and FDI attraction targets to seek promotion) are not consistent with central edicts to reduce funding for polluting industries, enforce intellectual property rights, enforce environmental standards, enforce worker rights in factories, prevent illegal land seizure by developers, suppress investment in resource intensive or over-heated industries, or to limit speculation in the property market. China's volatile 'business' cycle in the 1990s, the damaging duplication of resources within and across regions, and the non-performing loans this era begat, had the fingerprints of the central/local incentive mismatch all over it.

Unless the fundamental tensions in the governance structure are addressed, it is difficult to foresee China achieving its national emissions and energy efficiency targets. If China misses these targets by wide margins at distant time horizons, the constraints on the future path of the industrialization strategy will be severe.

The way to address this issue is to reduce the influence of political and bureaucratic fiat in the economy. From a macroeconomic policy perspective that implies a greater reliance on market based tools as opposed to administrative ones. Beijing's collective mind has come to a similar conclusion. Interest rate deregulation (Song 2005), exchange rate and capital account reform (McKay 2007), product market and services sector deregulation (Findlay *et al* 2007, Huang *et al* 2007) are all underway to varying degrees in China's patented gradualist style.

The risk that a cyclical downturn will reduce the appetite for change is constantly apparent. Timid leadership would delay the moment when market price signals gain primacy in directing strategists to the most lucrative projects. Allowing the strategic inflation signal to operate without distortion is a prime function of a nation's strategic leadership. Failure on this measure can lead to extremely damaging periods of strategic deflation brought about by unwise decisions based on impure pricing signals. Japan's awful experience after 1990 is one example. If China is to avoid a future strategic deflation, and transition smoothly from its current sub-strategy prior to its exhaustion, the leadership would be well served to cease diluting strategic inflation.

An additional element of risk relates to China's ability to innovate. It has been noted already that the apparent increase in sophistication of Chinese exports is mainly explained by the activities of foreign firms. There is a real concern that China's strategic organizations may not be up to the task of endogenous innovation when their cost competitiveness erodes.

China's national champions are huge companies, but they have little or no brand recognition outside the country. How many western laymen can name the industries that Haier, Gome, Wahaha, Geely, Li Ning, Bird, Lenovo, Tsingtao, Citic and TCL are active

in? A “Made in China” label is not a resounding recommendation to a western consumer. Japanese manufacturers made their way over that hump, and Korea’s are making their way over one industry at a time. Both countries feature strategic organizations that have historically competed fiercely via innovation in contested internal oligopolies. China has essentially outsourced innovation to the foreign firms who have populated its special economic zones. That has sped up the early phases of outward oriented industrialization, but it guarantees nothing regards the middle and later stages.

If China is to join the strategic core a century from now, it must reach a point where it is independently generating strategic ideas. There is nothing inevitable about this development. Those who have looked at the Maddison dataset (2003) and argue that China is merely regaining its rightful place in the world are selling snake oil. China (and India) fell behind Europe and its offshoots due to failure to technological change as an umbrella dynamic strategy until the last few decades. The Neolithic technological paradigm that preceded the Industrial Revolution placed land and labour as the key determinants of potential output. China had plenty of both of course, which meant it was always going to be a large contributor to global output under those particular technical conditions.

If we were still in the Neolithic paradigm the reversion to mean argument would by viable. However, the current paradigm is dominated by those with the ideas and the depth of technology, not the basic resources cherished by Quesnay and his contemporaries. As a relatively new participant in the global strategic transition, China is negotiating the early stages of industrialisation with aplomb. But future membership of the strategic core will depend upon the Chinese ability to innovate and not its brawn.

Is a successful strategic outcome for China all but assured? Of course not. Environmental pressures could impinge upon a path of exponential progress. Internal governance issues might delay the timing and hamper the implementation of crucial reforms that will keep the strategy from transitioning in the desired direction. How China’s strategic vector, particular its strategic organizations, will perform at higher income levels is a great unknown. None of these risks are trivial. Strategists within and without China would do well to heed them.

8. A memorandum on the Australian response

Australia is a resource rich, economically and financially open, reasonably wealthy, labour scarce, English speaking and Asian facing economy. The nation is currently enjoying a wave of prosperity driven in large part by a boom in its international terms of trade. The rise in the terms of trade, has, in turn, been heavily assisted by the sharp lift in China’s demand for a broad range of energy, resource and rural commodities that Australia has the good fortune to produce. China’s increasing prominence in the commodity markets and as a contributor to global growth more generally, has raised the sensitivity of the Australian economy to developments in the Middle Kingdom. Australia’s strategic outcome in future generations will not be independent of China’s.

In section 6 above, arguments that China has a reasonable chance to transition its current industrialization sub-strategy successfully prior to its exhaustion were put forward. In section 7 important caveats were raised that argued it would be most unwise to assume that an adverse outcome is not possible. On balance, the portents for longer run Chinese growth are sound but not overwhelming. Australia's strategic leadership should acknowledge this reality and attempt to hedge against the risk of unsuccessful strategic transition in China without limiting its ability to leverage off a successful one.

Australia's GDP per capita relative to the United States has been on a modest upward trend for the past five decades (figure 8.1). As a percentage of the US level, Australian output per head has ranged between 71% and 81% since 1950. Australia has twice retreated from the high point of 81%, in 1975 and in 2003. Where productivity levels alone are compared, Australia looks slightly better, reaching a peak level of more than 85% in the late 1990s.[26] However, when the average rate of productivity convergence among OECD countries is accounted for, Australia has proved to be a laggard for the majority of the post war period (Dolman 2007).

To put it bluntly, Australia's strategic outcome over the last half century or so has been disappointing. Figure 8.2 illustrates that Australia began the postwar period with living standards higher than Canada, Japan and the average of the wealthiest European economies. Canada and the Europeans closed the gap quite quickly and have spent a great deal of the time period ahead of Australia. The Japanese story is documented elsewhere in this paper. Australian living standards exceeded the average OECD level by 15% in 1950. That gap has narrowed to 5% today. Even the supposed "golden age" did not enable Australia to forge ahead in relative terms. Among this sample of peers, Australia looks resilient only compared to the disastrous relative decline of New Zealand.

A balanced reading of the data argues that Australia has done little more than benefit from outward shifts in the productivity frontier itself while exhibiting only the barest rudiments of catching up. It has been unable to make a decisive move into the upper echelon of productivity achieved by the leaders of the global strategic transition. As a consequence it has produced an underwhelming advance in relative living standards. The corollary of this shortfall is that there has been an historical failure of strategic leadership.

The data would be even less flattering if Australia had not enjoyed a period of pronounced strength in the current decade, driven by a historically significant boom in the price of resources. This has had a predictably large impact on Australia's international terms of trade (figure 8.3). That has inflated the growth rate of gross national disposable income, which has in turn boosted employment growth, labour compensation, profits, business investment and taxation revenues. Effective demand has consistently exceeded domestic supply potential by a material margin, chewing up the economy's dwindling spare capacity. Interest rates have been raised multiple times in response.

The recent period raises a number of important backward and forward looking questions regarding Australia's choice of dynamic sub-strategy. What was wrong with the historical system that left the economy short of aggregate supply capacity in the midst of a once-

every-other-generation commodity boom? Was this specific shortcoming related to those that produced such a meek performance in the preceding fifty years? Should the leadership seek to design the future sub-strategy treating the current state of affairs as the new norm, or as a temporary windfall? How might the leadership hedge the national strategy against the possibility that the windfall thesis is the closest to the truth?

These are substantial questions requiring significant answers. To address them, we recall the theory in section 2, which detailed the composition and dynamics of the strategy function. The strategic outcome relies upon physical factors, technological factors, economies of scale and a vector of strategic variables. The latter, agglomerated as π, unlock synergies across the other factors to endow the function with dynamic characteristics.

Australia has been well served historically by the basic physical factors that support the strategic outcome and offer methodological guidance for the strategic pursuit. Australia's rich natural resource endowment is well known. For the majority of the period of European settlement, the exploitation of the resource base has dominated strategic thinking (Snooks 2007).

Since 1950 labour input growth has been consistent due to both a declining dependency ratio, a strategic increase in female participation (Snooks 1994, 2007) and a steady long run net inflow of migrants. Low population density has allowed land intensive activities not viable in many competing jurisdictions.

On the other hand, economies of scale have been difficult to achieve with a small population and the spatial realities of Australia's remote location and the pattern of its settlement. The Australian economy is still far too small to eschew the benefits of external economies of scale. Further, Australia's geographic remoteness (Blainey 1966) has reduced access to the benefits of agglomeration, contiguity and the associated lowering of transaction costs identified as significant in the productivity literature (Ciccone & Hall 1996, Dolman 2007, Caves 1984). Low population density by global standards, despite urbanization expanding rapidly under the paternalistic technological paradigm instigated during the inter war period (Snooks 2007), has diluted the potential for achieving internal scale economies further.

The leadership's decision to pursue an inward looking strategy in the 1950s and 1960s is particularly perplexing with hindsight, despite the acknowledgement of the geographical hurdle. The economy's laggard performance in this era can be laid squarely at the feet of this misguided sub-strategy. High relative transactions costs (e.g. freight) are a major handicap in competitive markets for homogeneous goods. Transaction costs are not as great a burden in the provision of high value added and/or differentiated goods as they comprise only a minor part of the overall cost base. The market for tradable services operates under similar parameters. Rather than encouraging Australian strategists to look inward – a method that had a low upside – the strategic leadership should have encouraged an outward orientation with a focus on selling products and services into external markets that others were not.

The historical quality of Australia's labour force has also been notably weak in relation to the innovative strategists operating at the productivity frontier. Average years of schooling have consistently trailed those of the United States, with full catch-up on this measure not expected until the late 2020s (Dolman 2007).[27] In the 1940s, the proportion of the Australian labour force aged between 55 and 64 years with at least upper secondary educational attainment was less than 50%. That compared to a figure above 80% in the US at the time. Matters have certainly improved since, but a substantial gap remains (Davis 2006). To paraphrase Krugman's (1994) judgement in relation to his critique of the Asian economic "miracle", this was a workforce better adapted for perspiration than inspiration. Figure 8.1 shows that Australia's GDP per capita was closer to the US level than GDP per hour worked right up to 1980. That offers further evidence that Australian's were working harder, rather than smarter, in this period.

As for technology, a protracted expansion of business investment characterized the 1960s, deepening the nation's capital stock and progressively adding to supply potential. We may take this as a sign that strategic confidence was building through the decade, as the comfort of years of benign domestic and global demand conditions cumulated in agents' minds. Foreign manufacturing firms contributed to the expansion by bringing their technology to Australia, as they chose to invest behind the prevailing tariff walls rather than import finished products. Foreign services firms were not all able to participate in the same way. Foreign banks, for example, remained locked out until the middle of the 1980s. The lack of vibrant competition in the services sector and tight regulation reduced the imperative to innovate, leaving productivity levels in these activities well behind strategic benchmarks.

As for the strategy vector, comprising leadership, ideas and organizations, by opting for and pursuing a sub-optimal strategy, it was a collective drag on the strategic outcome for the passage of the 1950s and 1960s. The strategic confidence that developed through the 1960s, illustrated by the elevated investment ratio, was of a curious nature. Confidence in a sub-strategy that is fuelling a rise in relative living standards is one thing. Confidence in a sub-strategy that produced stagnant relative living standards is quite another.

A poorly performed leadership, a modestly educated workforce and a wrong-headed inward orientation that limited the ability to garner scale economies was not an auspicious strategic combination. From the 1970s forward a succession of more decisive administrations altered the strategic mood. Reforms of the traded goods sector; finance and taxation; transport; utilities; communications; higher education; the labour market, monetary, exchange rate and competition policy collectively put the economy on a more flexible and outward oriented footing. The fruit of this concentrated strategic effort was a starkly improved relative productivity performance in the 1990s.

That brings us back to the recent past. Despite the improved productivity performance in the 1990s, strategic confidence ended the decade at a low ebb. Weak corporate and household balance sheets at the start of the decade, the strategic deflation of the Japanese economy, the dramatic evaporation of strategic confidence in emerging East Asia in

1997/98, a downtrend in resources prices that dated back to the 1980s (figure 8.3), a lagging exchange rate and the hype associated with the information technology boom, of which Australia was not a skilled purveyor, all suppressed confidence at various times. When the current decade began with a global equity market crash and an ensuing recession in the US, Asia and Europe, confidence took a further hit.

The end result was that the investment share of Australian GDP fell from a late 1980s peak of 28% to just 22% in 2000/01. This declining emphasis on building the capital stock left supply capability weak when the global demand cycle turned in 2003. At a time when the prices of Australian commodity exports essentially tripled, the export volume response has been alarmingly weak (figure 8.4). At a time of immensely strong global growth, unequalled since the 1960s, manufacturing and services export volumes have been feeble (figure 8.5). These resounding external strategic signals have generated a private sector investment response (figure 8.6), but a sluggish one given the low base and the strong rise in the profit share observed through the period (figure 8.7).

A strategic administration can ratify external strategic signals by boosting its own investment in infrastructure. Public infrastructure investment raises private sector productivity directly and by encouraging complementary private projects that deepens capital stocks within organisations. Despite an ever strengthening fiscal position over the last decade, accelerated recently by the terms of trade boom, the lack of investment in the scale and quality of Australia's core infrastructure has been a consistent drag on strategic confidence.

A report by Engineers Australia (2005) argues that no segment of the infrastructure sector rates an "A", defined as fully fit for current and anticipated future needs. Roads rated a C+; Rail a C–; electricity a C+; gas a C+; irrigation a C–; storm water a C–; ports a C+; airports and telecommunications[28] a pair of Bs. The report cited research by a consultancy that estimated aggregate under-investment in infrastructure stood at $A24.81bn, roughly 2¾% of GDP. That amount pales before the 10% of GDP in actual central government surpluses recorded since 1997/98. Clearly, the availability of public funds has not been the problem (figure 8.8). Leadership relating to the strategic deployment of those funds certainly has been. Regardless of sub-strategic choice, a developed nation can not expect to move assertively towards the productivity frontier with a recent past of under-investment in capital infrastructure.

Even more damning has been the lack of emphasis on labour quality and innovation. The centre of this fundamental imperative is the education system. The number of tertiary level students has risen 33% between 1995 and 2003, a relatively large increase for a mature country. That spike in student numbers has increased tertiary attainment levels among 25 to 64 year olds above the OECD average to a level 79% of the US' in 2004, versus 73% in 1995. However, Australia is an egregious outlier among mature countries with real expenditure per student in tertiary education declining by 6% in the same period. (OECD 2007: 183). The next worst performance was flat real expenditure. And that is despite fiscal pressures in Europe and North America not evident in Australia. Australia looks more average when levels of spending are compared. But one certainly

sees a lack of strategic ambition when Australian outlays per student are less than half those of the United States. This is not the way to build a workforce that will innovate its way into the upper echelons of productivity.

For the education sector as a whole, public outlays have fallen from 4.5% of GDP in 1995 to 4.3% of GDP in 2003. Including private expenditures, the national total rose from 5.5% to 5.8% in the same timeframe. That is below the OECD average and around 77% of the US level in 2003. In 1995, total education outlays were 76% of the US' (OECD 2007: 185).

At a time of remarkable fiscal flexibility for Australia, these quantitative measures of the administrative focus on education point towards a middling interest and a void of ambition. Two offshoots of Australia's unexceptional education outcomes are the weak state of the research and development (hereafter R&D) sector and a poor relative record of international patent filings.

At just 1.64% of GDP, Australian R&D outlays are just 62% of the US level. The Japanese and Scandinavian economies routinely invest at double the Australian level. Australia employs fewer researchers per capita than the US (81%) who in turn supply less than a third of the US' output of patents per capita (OECD 2007: 146-51). As figure 8.9 shows, moderate under-performance in quantitative commitments to education and innovation becomes major under-performance in the quality of system output.

If Australia's strategic organizations wished to compete with the United States and others in generating strategic ideas, the least they could do would be to put an equivalent amount of resources into research. The data presented above says that this is not happening. On no measure across the broad category of education, research and innovation does Australia match or surpass the equivalent US level. On many measures it is a laggard not just relative to the US, but to the OECD average as well.

Interestingly, one of Australia's stronger relative performances is in the scaled number of researchers employed. When we match this commitment to output of patents, the phrase "harder, not smarter" again springs to mind. To repeat the data presented above, with 81% of the US level researchers per head, Australia produces less than a third of the international patents per head. The strategic organizations in the United States employing these researchers enjoy triple the pay-off of their Australian counterparts.[29]

There are strong, divergent strategic signals operating in the two economies. In Australia, R&D has shown a low return on investment, disallowing the rise of confidence among strategists in an innovation sub-strategy. In the United States, R&D has shown a much higher rate of return, and therefore strategists are happy to channel resources into innovative endeavours.

The reasons for the large gap in historical experience are related to the quality of the researchers themselves, the resources they are given to work with, scale factors and incentive systems within organizations and in the wider policy context. Taxation

incentives for R&D, the level of income tax, intellectual property rights protection, the user cost of education, the expected private return to education, immigration policy and competition policy are all relevant to the discussion of innovation. If Australia's strategic leadership were serious about reaching US productivity levels, a much more accommodative policy framework would have been in place a long time ago. Further, a greater emphasis on educational catch-up would be observed, so that local organizations willing to invest in research have competitive employment options. Yet it is hard to escape the fact that the relative and absolute quality of Australia's labour force has been held back by a meek investment in the education infrastructure.

The joint evidence of under-investment in capital and education infrastructure infers that the administrations of the last decade or so have harboured extremely timid ambitions for Australia's strategic outcome. A serious tilt at catch-up to the leaders of the global strategic transition, building on the successful unwinding of the many negative distortions of the paternalistic era, would have necessarily elevated education and capital infrastructure to the forefront of thinking. Rather, official discourse has focused on a blind adherence to the mundanities of fiscal austerity and inflation targets. Each of these objectives, by definition, suppresses out-sized strategic price signals: the very signals that a strategic leadership should allow to display at full prominence. Ergo, these twin pillars of contemporary Australian policy are damaging tools in the wrong hands.

The task for the future leadership is to recast the emphasis. The inflation targeting regime should be much more flexible to allow strategic inflation to resonate through the system. The current scenario is a prime illustration. In the midst of its largest positive terms of trade shock in fifty years the Australian economy is facing pervasive capacity shortages in both labour and capital. This is underwriting gains in factor and asset prices and worrying the monetary authorities, who have a target to uphold. But as this target is achieved through the manipulation of demand via an interest rate instrument, it is more likely to exacerbate the problem than serve as a part of the solution.

Increasing the returns to employment (raising wages for incumbents and attracting non-participants) and increasing investment in infrastructure and the rest of the capital stock is the correct response to the contemporary demand environment. Yet wage rises (or participation enhancing tax cuts) would be guaranteed to put the inflation target under even greater pressure. An investment boom is likewise not on the monetary authority's wish list when prices are already dangerously close to its target ceiling. So we have the awkward situation where it can be argued that the monetary authority's short run incentives are not consistent with the nation's medium term strategic interest.

As stated above, administrations should distinguish between strategic and nominal inflation. Further, an understanding of cyclical and structural elements of inflation changes is crucial for well designed policy. If the current terms of trade boom were deemed to be permanent, it would be wasteful to dull its impact through counter-cyclical policy. If it was not deemed to be permanent, but the strength of the nominal signal was anticipated to be too strong for strategists too resist, then an activity dampening policy would be appropriate.

These final points bring us to the critical judgements facing Australian strategists today. Is a resource exploiting, externally leveraged sub-strategy - Australia's historical forte – also the best option for the future? Is the rise of China, and everything it promises for resource rich locales, communicating a strategic signal that should not be ignored?

In the face of this uncertainty, Australian strategists are thankfully not facing an independent binary choice. China's own strategic prospects for coming generations are sound but not overwhelmingly so. To enhance the national capability to leverage the benign China story, upgrading the nation's stock of physical infrastructure is the obvious strategic project. To hedge against the possibility of the more pessimistic projections coming to fruition in China, thereby unhinging a resource dependent sub-strategy, Australia must make an independent effort to achieve an assertive move towards the upper echelons of global productivity performance. This will involve a wholesale reassessment of the scale of resources that should be directed to the education sector and by extension, the research/innovation infrastructure.

Australia has a store of "advantages of backwardness" in education: latent but prime for mobilisation. The huge financial buffer created by the terms of trade boom, both in terms of income flows and the growing wealth stock, offers the leadership an exceptional opportunity to finance this enormous task without unduly hindering other on-going commitments.

This statement does not ignore the realities of fiscal policy in the face of a rising dependency ratio through ageing as outlined in the second *Intergenerational Report* (hereafter IGR, Commonwealth of Australia, 2007). Yet a successful transition to an endogenously determined dynamic process will see long run productivity growth out-strip the modest projections in the IGR.

The IGR assumes 1.8% long run productivity growth in its core scenarios: or a tick below a consensus of long run estimates of productivity growth in the US (Dolman 2007). *That implies that the current administration is content to argue that there will be no catch-up to the global leadership over a horizon long enough that it is tractable to assume a blank sheet for policy and strategic direction*. Surely no more pessimistic statement has ever been communicated to a nation's potential strategists. A new pattern of thinking is clearly warranted if Australia is to improve on the disappointing strategic outcomes of the prior half century.

9. Conclusion

This essay has considered the economic performance of East Asia's two largest economies in the context of dynamic strategy theory. First in Japan, and then later in China, two 'developmental' states adopted strikingly successful industrialisation strategies with a common thread of outward orientation. Japan's strategy matured in the 1970s, exhausted sometime after, and pitched the economy into a painful deflation in the 1990s. China's own outward-oriented strategy, which is currently stimulating rapid

economic growth and differs in many important respects from Japan's, was then analysed in an attempt to examine its future viability.

China's prospects for adapting an alternative strategy prior to exhaustion were then considered. The conclusion was that it is reasonable to expect China's strategic leadership to attempt to transition towards a sub-strategy that continues to sponsor industrialization through exploitation of the mass internal market in the broad context of outward orientation. Furthermore, the contemporary sub-strategy is clearly far from exhausting itself. However, the risks surrounding the transition, ranging from the environment, to governance, to resource availability, are far from trivial. On balance, the portents for long run Chinese growth are sound but not overwhelming.

An Asian-facing resource rich economy such as Australia would do well to bear these risks factors in mind. Acknowledging these realities, Australia's strategic leadership should attempt to hedge against the risk of unsuccessful strategic transition in China without limiting its ability to leverage off a successful one.

In the face of this uncertainty, Australian strategists are thankfully not facing an independent binary choice. Upgrading the nation's stock of physical infrastructure is the obvious strategic project that will enhance Australia's ability to leverage off a benign Chinese growth story. To hedge against the possibility of the more pessimistic projections coming to fruition in China, thereby unhinging a national resource reliant sub-strategy, Australia must make an independent effort to lift itself towards the upper echelons of productivity performance. This will involve a wholesale reassessment of the scale of national resources that should be directed to sparking an endogenous dynamism mechanism built upon a vastly improved innovation infrastructure.

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[1] "East Asia" describes the nation-states commanding that portion of the Eurasian continent that faces the Pacific. Specifically, in this paper "East Asia" will mean a composite of Japan, Greater China (the People's Republic, Hong Kong special administrative region and Taiwan province), the Republic of Korea (the South), Singapore, Indonesia, Thailand, Malaysia and the Philippines. Other country groups referred to are the Newly Industrialised Economies (the NIEs: Korea, Taiwan, Hong Kong, Singapore); the Association of South East Asian Nations (ASEAN: Singapore, Indonesia, Thailand, Malaysia and the Philippines). At other times it may be useful to refer to East Asia ex Japan, or ex Japan and China. India and other South Asian or land-locked countries are not included. Nor are the non-strategic states (Snooks 1998) in the region such as Myanmar (Burma), Cambodia, Mongolia, the Democratic Peoples Republic of Korea (the North), Laos and Papua New Guinea. Vietnam is included selectively where data constraints allow. Where weighted regional aggregates are presented, purchasing power parity exchange rates are used for the computation.

[2] Gross national disposable income (GNDI) is a preferable measure of the strategic outcome to the more common gross domestic product (GDP). GNDI is a purchasing power concept that is superior to the supply based GDP. To calculate GNDI, exports are deflated by the import deflator to capture their worth in barter. GNDI is therefore better suited to capture the price signal from the international terms of trade that is central to the strategic feedback mechanism. However, comparable time series of GNDI are not readily available for Japan and China, so GDP will have to suffice. For details on the respective measures, see ABS (2000) chapter eight.

[3] Strategic leadership can come from any agents able to provide or control the signaling mechanisms in the economy that impact upon strategic confidence. The strategic administration (the bureaucracy and the executive) is the most important element of strategic leadership, but the role is not necessarily a state monopoly. In practice, any agent with an encompassing interest is a candidate.
[4] All figures cited here are author calculations from underlying data sourced from the Groningen Growth and Development Centre and the Conference Board Total Economy Database, www.ggdc.net. National data are measured in 1990 US dollars converted using Geary Khamis purchasing power parities.
[5] Japan's *Foreign Exchange and Trade Control Law* was revised in December 1980 to make foreign exchange transactions "free in principle". The real demand criterion for foreign exchange transactions was dropped in 1984. Prior to these revisions, any foreign exchange transaction theoretically had to be approved by the Finance Ministry. See McKay (2004). For a narrative of financial reform see Brown (1994).
[6] An "exportable" is a good or service that may be sold either locally or in the global market. An "importable" is a good or service that may be imported or produced locally. The realised traded share of these categories can be influenced by strategic policy makers.
[7] This is a variation on the "Old Bolshevick" notion of primitive socialist accumulation via strategic sectoral price distortions associated with Preobrazhensky (1967) and Bukharin.
[8] All price data in this section is sourced from the OECD's *Main Economic Indicators* database accessed via the Econdata subscription software package.
[9] An in-depth discussion of cycle/wave theory is beyond the scope of this paper. Suffice to say that the school of thought ascribing a regular rhythm to economic activity and prices of predictable duration has been discredited (Solomou 1990, Snooks 1998a). While no consensus has emerged after the fall of the Kondratieff, the concept that attracts the author's sympathy is that "wave-like surges", of various duration and fluctuating amplitude are evident on a balanced reading of the data. These wave-like surges are associated with the rise and decline of dynamic strategies and sub-strategies at the highest level (Snooks 1996, 1998a, 1999). The Marxist view of the long cycle remains extant (Mandel 1995), and the Schumpeterian (1939) and Kuznetsian (1930) propositions modified to allow for the arrhythmic nature of the developing historical record, retain proponents. A comprehensive survey of the pre-Snooks literature is available in Rostow (1990).
[10] Strategic imitation in Snooks (1998a) is not the same thing as "entrepreneurial swarming" in Schumpeter. The key difference is that imitation in Snooks is a device for preserving the scarcest resource, intellect. There is no inevitable driving down of prices/profits under strategic imitation, as there is in Schumpeterian swarming. Indeed, strategic confidence may be consolidated and sustained by imitation, rather than being destroyed by it.
[11] Rostow (1973 [1960]) popularised the "leading sector" thesis of "take-off". This observation is not intended to echo the Rostowian tradition. His descriptive schema is no longer fashionable as it does not sit well with empirical developments since its publication.
[12] Olson (1971, 1982) offers the concept of the "distributional coalition". Such organisations are anti-strategic, as their chief concern is the distribution of the aggregate surplus (rent seeking), not surplus generation, which is the occupation of the strategic leadership and strategic organisations (Snooks 1998a).
[13] It is the author's opinion that South Korea has reached a similar point with its consumer electronics sector, while its automobile industry still has some way to go. The question of South Korea's strategic pursuit is the topic of a future paper.
[14] These arguments are also relevant to the relationship between non-financial firms and their "main banks". See Aoki et al (1994) and Sheard (1996) for a discussion of the main bank system. See McKay (1999) for an analysis of its relationship to broader national strategy over the course of the post war period.
[15] This phrase is associated with the work of Alice Amsden (1988, 2001). It was originally coined to describe the South Korean approach to outward oriented industrialization.
[16] The utility of exchange rate theory is limited by its inability to meet undemanding performance hurdles in a short or medium term forecasting environment, even with assumed foreknowledge of fundamental explanatory variables (Meese and Rogoff 1983). However, purchasing power parities, based on the law of one price, do have some predictive power over long horizons, and may be usefully employed over the course of decades, if not years (Froot & Rogoff 2005: 1658-1662).
[17] This metaphor is used advisedly and with apologies to the profound message of Shusaku Endo's *Silence* (1980).

[18] The reader will note that in the discussion of Japanese development above, export, import and trade to GDP ratios were referred to frequently. The lack of a major FDI presence in Japan and the fact of a low import content in its manufactures through the industrialisation phase, a discretionary choice by the strategic administration, make this a defensible abstraction.
[19] These figures are inflated by the phenomenon of "round tripping", whereby funds are send offshore and returned as "foreign investment" to take advantage of the tax concessions that have been available. The degree of over-statement is debated, but there is no doubt that it is significant. The dominance of flows from Hong Kong and offshore tax havens is a shadow of this practice. See Chen (2007) for a discussion. The author's view is that this phenomenon will become less important following the equalisation of tax rates for foreign and local firms at 25% this year. That constitutes a rise in tax rates for foreign firms and a decline for domestic firms.
[20] Source is as detailed in note 4.
[21] This point has been made forcibly to the author by a number of figures in China's economic bureaucracy. Quantitative examinations of the "pull" and "push" factors driving Chinese internal migration do not explicitly model the distortions created by hukou. For two examples of these studies, see Song & Yu (2005) and Young & Deng (1998).
[22] A personal communication from a scholar at the *Research Centre for Rural Economy*, under the Ministry of Agriculture, Beijing, 11 September 2006.
[23] This is not to trivialise the immense challenge of wholesale land reform, the difficulty being amplified by the lack of a rigorous *ex ante* property rights regimen. *Hukou* reform, on the other hand, is a much easier matter, being at heart a fiscal policy issue.
[24] For a re-casting of the demographic transition as a dynamic strategic concept, see Snooks (1999: chapter 13).
[25] The average OECD country's energy use by sector can be stylised as one-third industry, one-third transport and one-third households. In China, industry is closer to one-half with transport vastly under-represented at one-tenth. As automobile ownership rises alongside urban incomes, this sector will increase its share of overall energy consumption rapidly.
[26] The source for all comparative data is as detailed in note 4.
[27] The timing of Australian catch-up may be too optimistic, as the rise in elder workers participating in education in recent years has been extrapolated by the authors of Dolman (2007). This jump in the participation numbers may reflect something other than a new norm, such as individuals making up for previous sins. Therefore, we might class this projection as something close to a best case scenario.
[28] Telecommunications rating is for 2001.
[29] This obviously assumes that all patents are born equal. This is unrealistic, as the code for MS-DOS has proved to be more valuable than the specifications for the Beta video recorder for instance. However, there is no evidence that Australia is turning out fewer but more valuable patents and the US is doing the reverse. If this were the case, it would show up in the macroeconomic numbers the analysis is framed around.

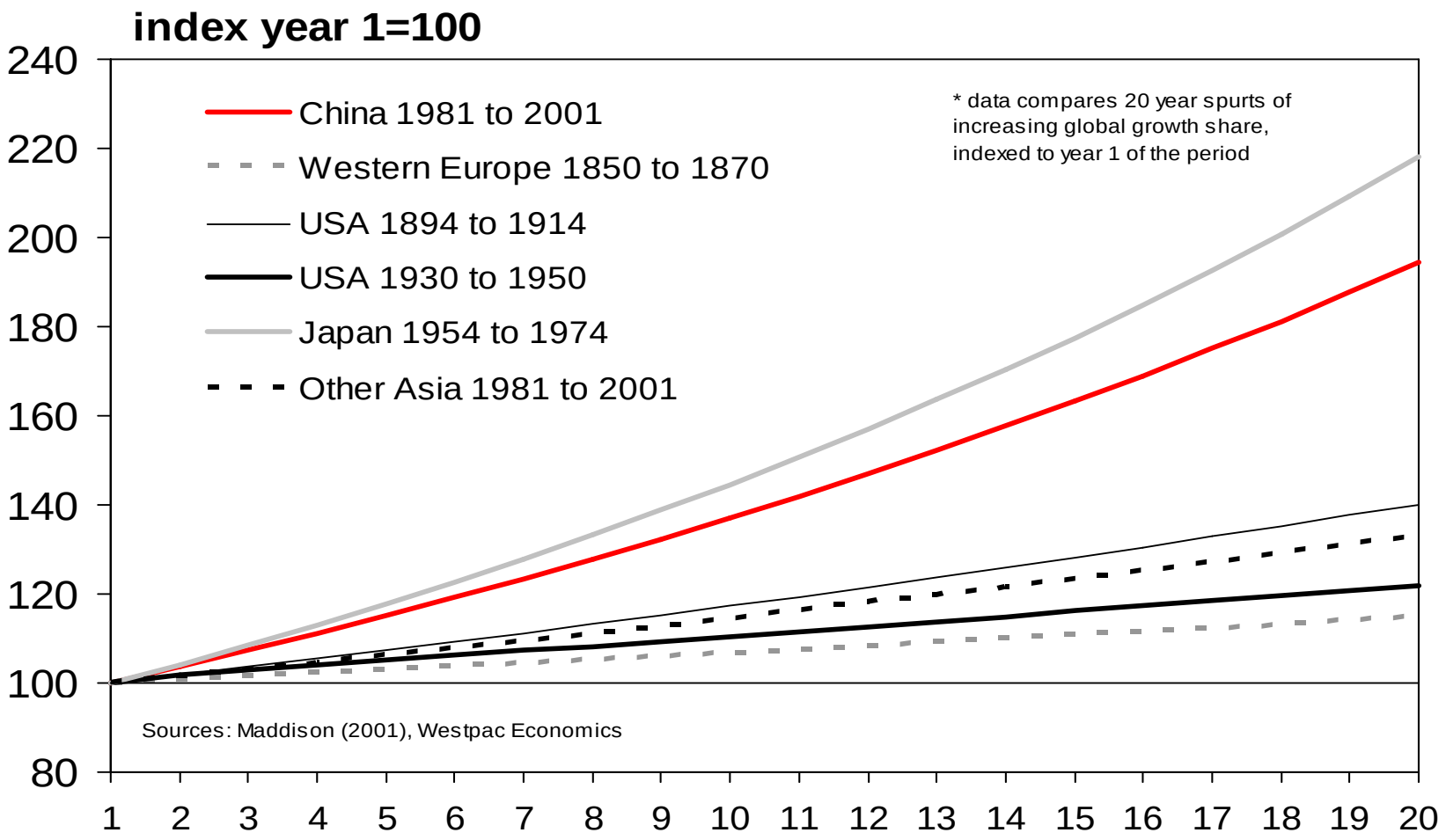
Asian industrialisation

Huw McKay

Section one

Introduction

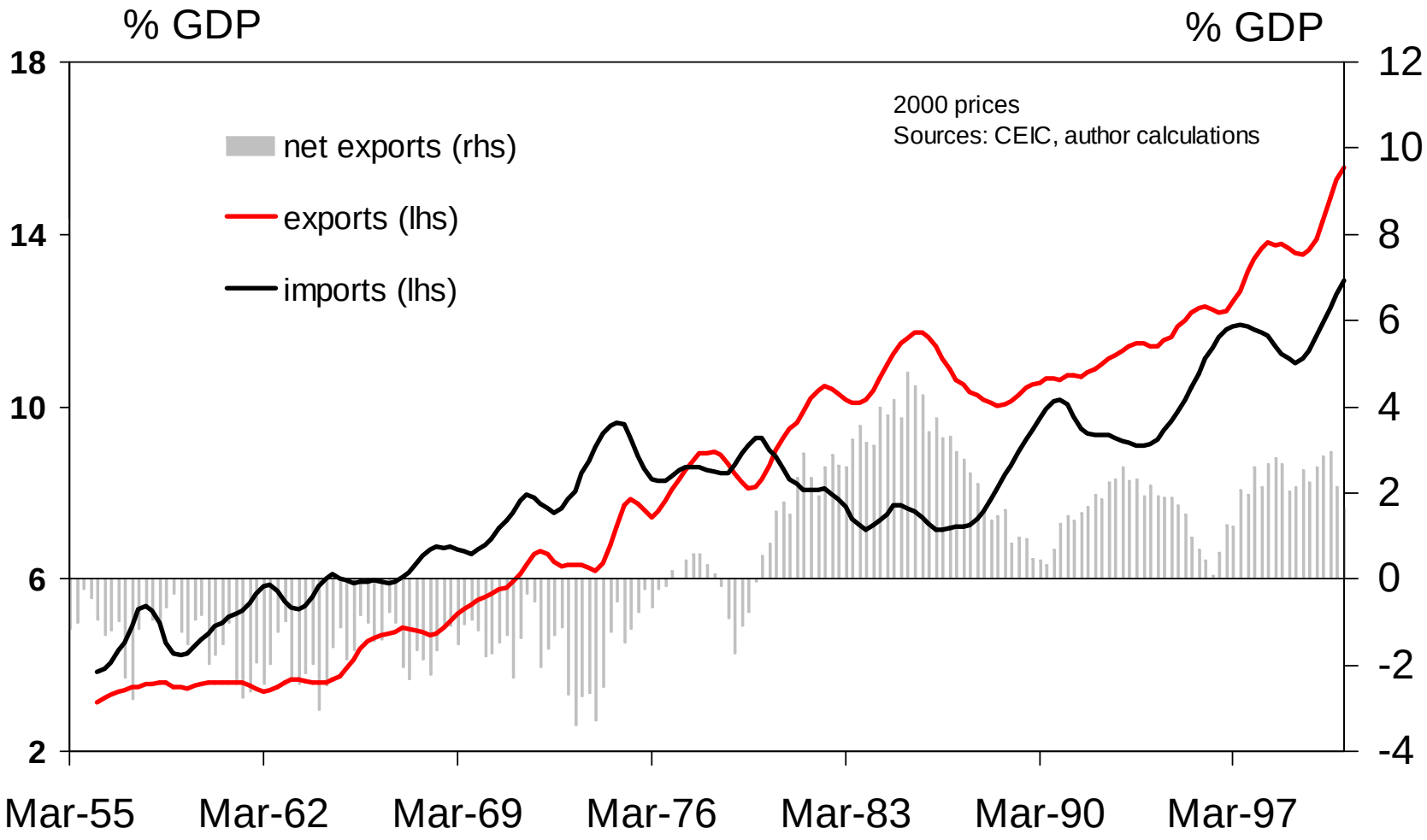
Figure 1.1: Asia's rise in comparative perspective*



Section three

Japan’s pursuit

Figure 3.1: Japanese trade volumes & net exports



Section four

A technical aside

Figure 4.1: Outward oriented industrialisation

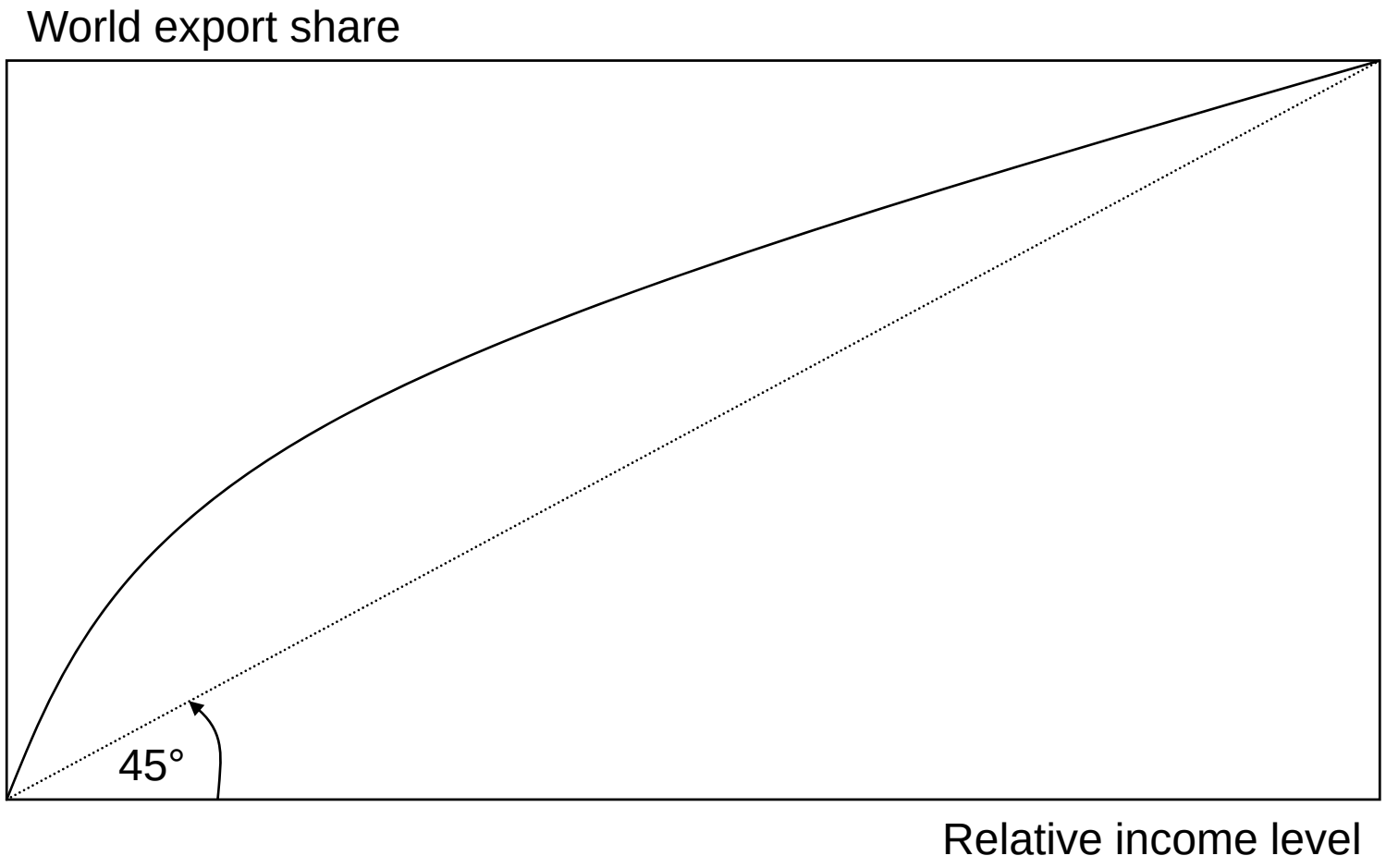
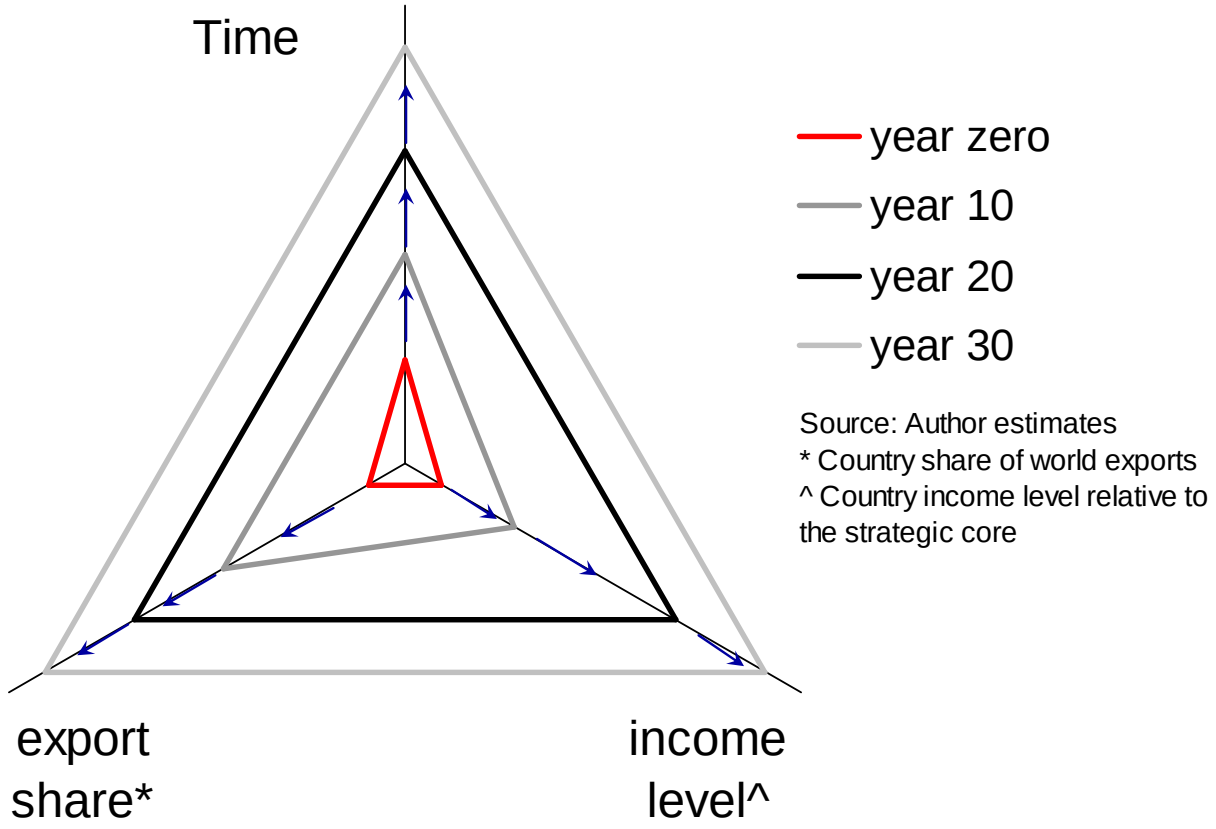
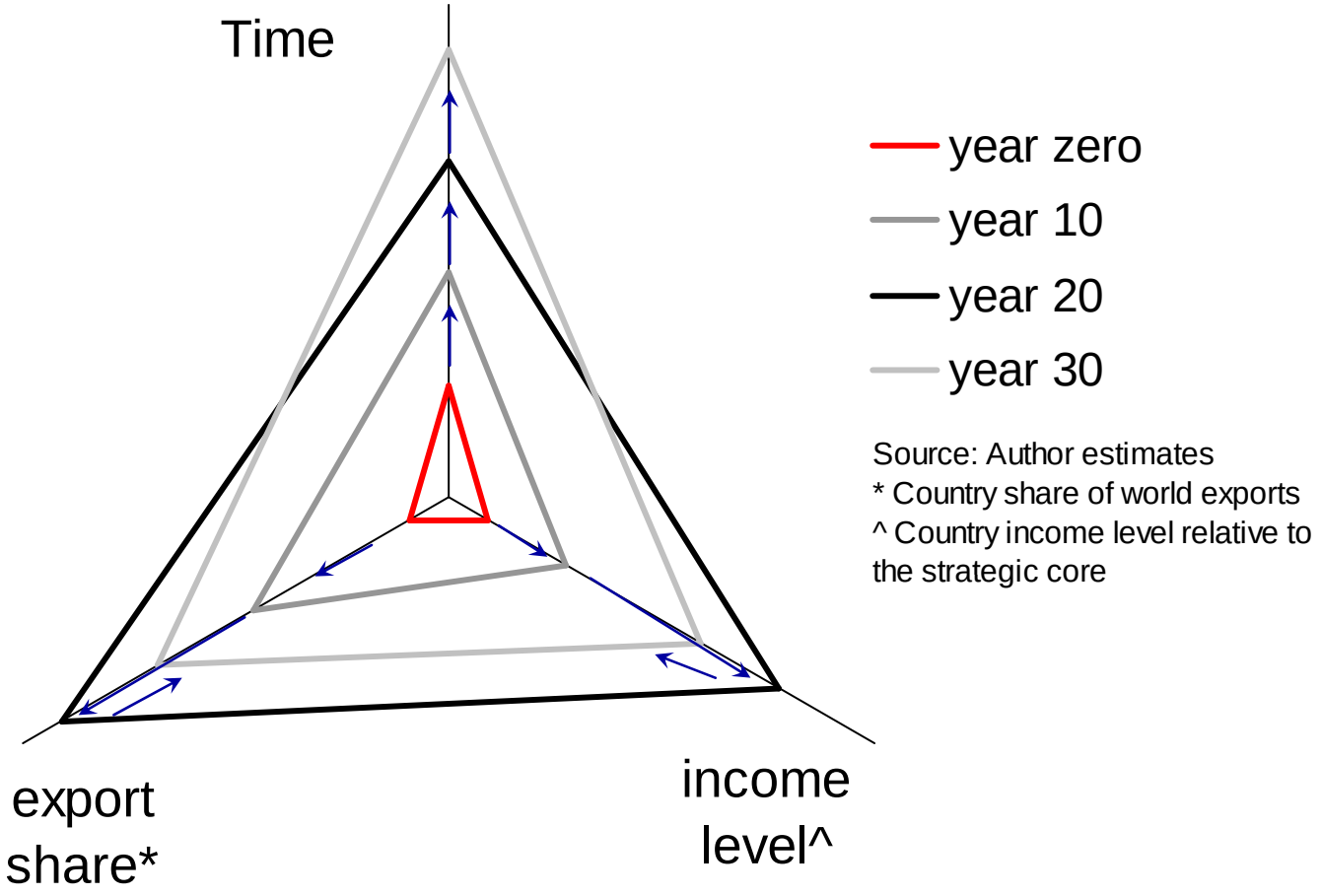


Figure 4.2.i: successful outward orientation



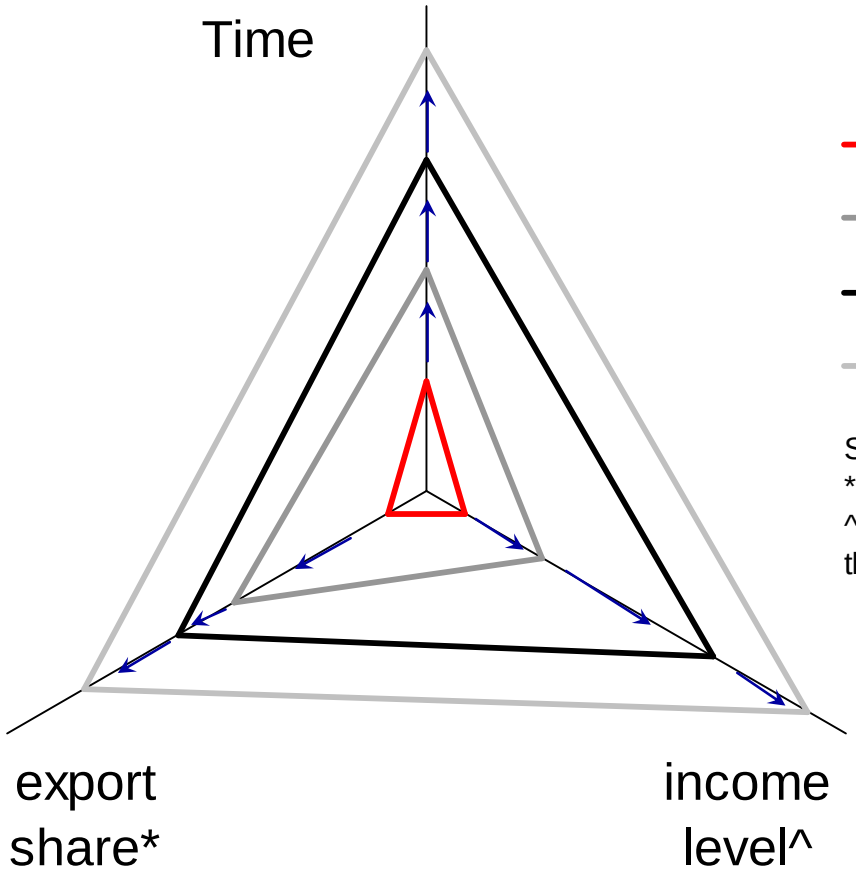
Source: Author estimates
* Country share of world exports
^ Country income level relative to the strategic core

Figure 4.2.ii: export dependence that exhausts



Source: Author estimates
* Country share of world exports
^ Country income level relative to the strategic core

Figure 4.2.iii: transitioning to a domestic strategy



Source: Author estimates
* Country share of world exports
^ Country income level relative to the strategic core

Section five

Japan continued

Figure 5.1: Japan's strategic footprint

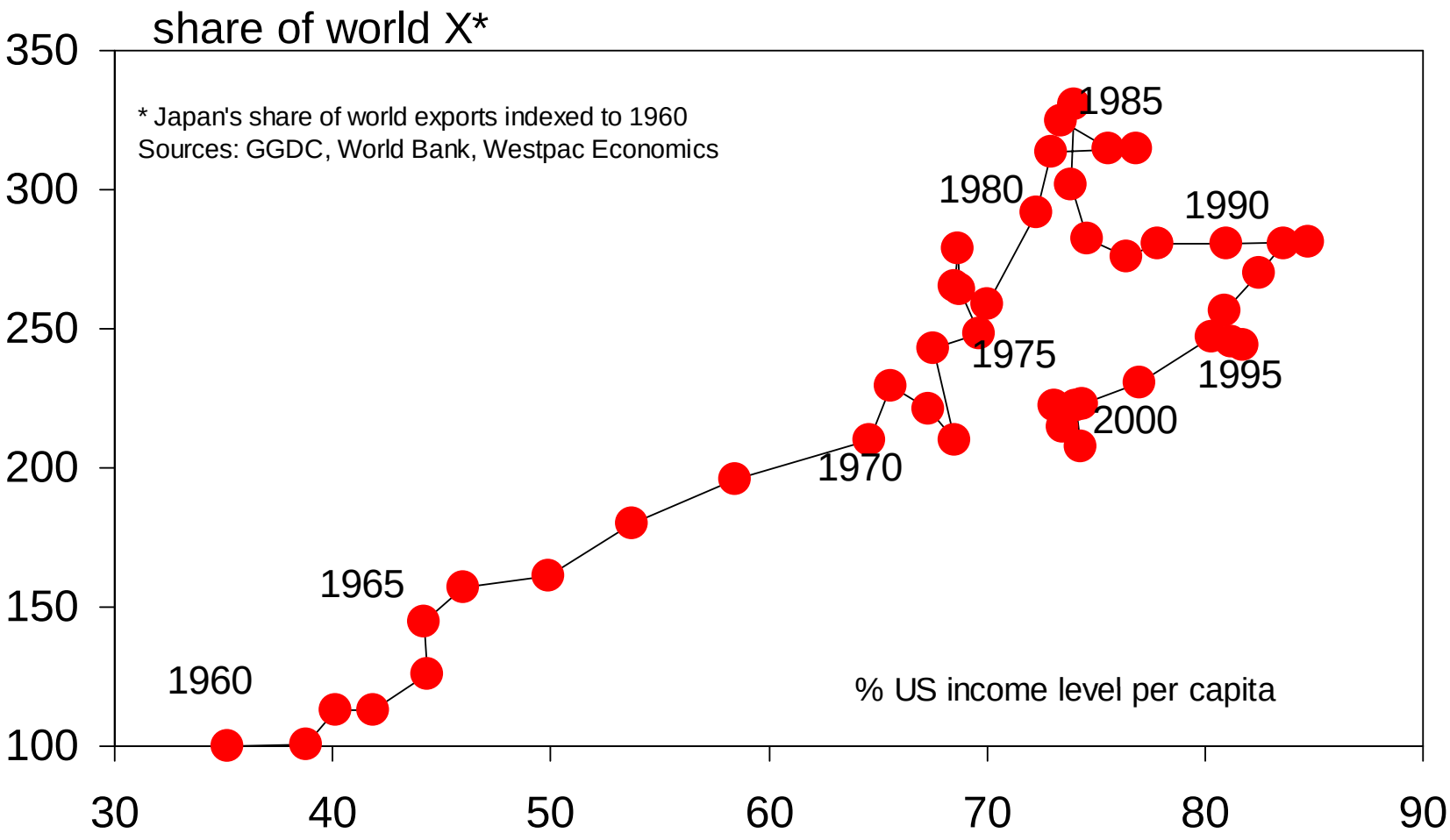


Figure 5.2: World GDP and export volume growth

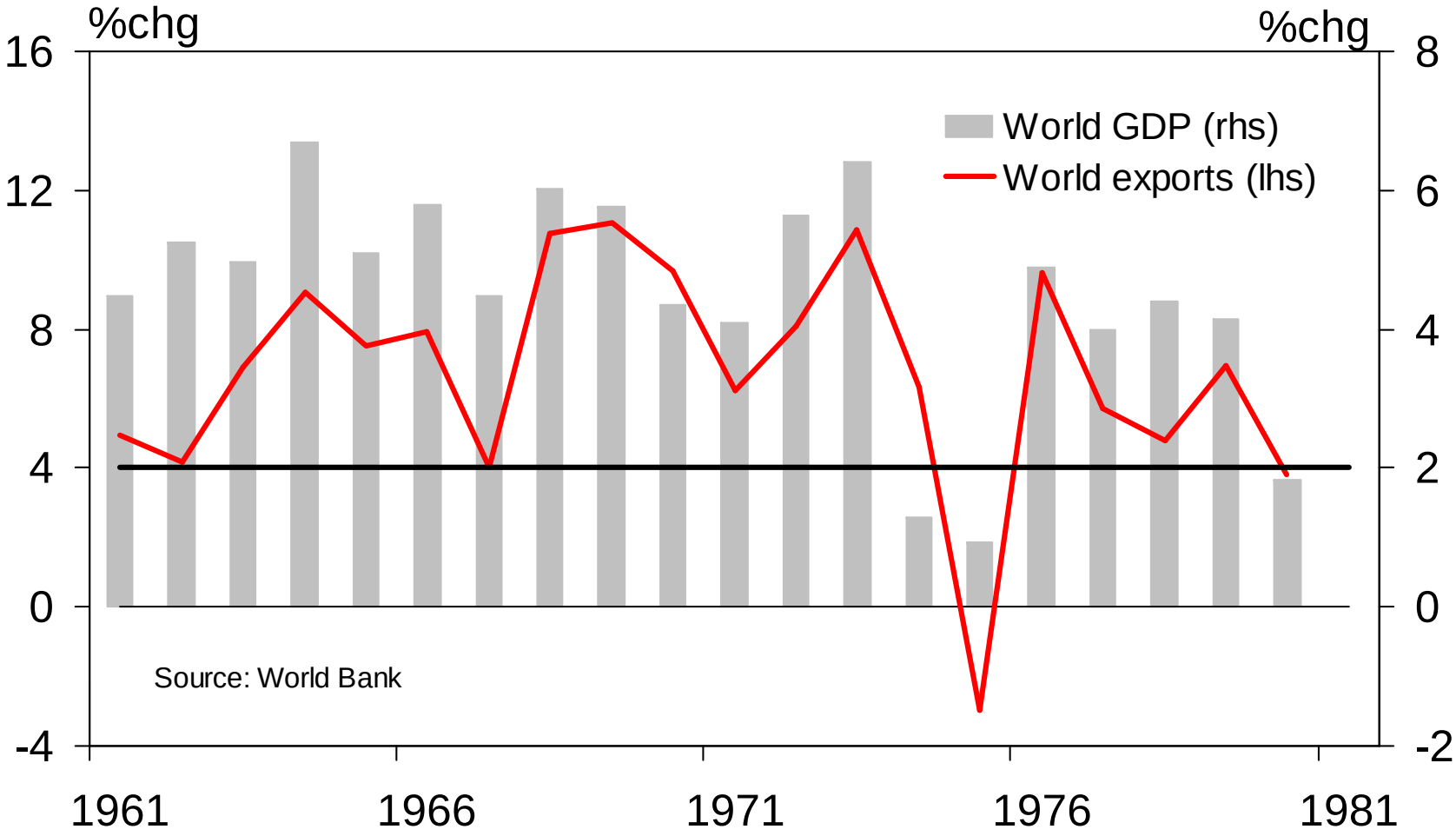


Figure 5.3: Japan's strategic pursuit 1960 to 1973

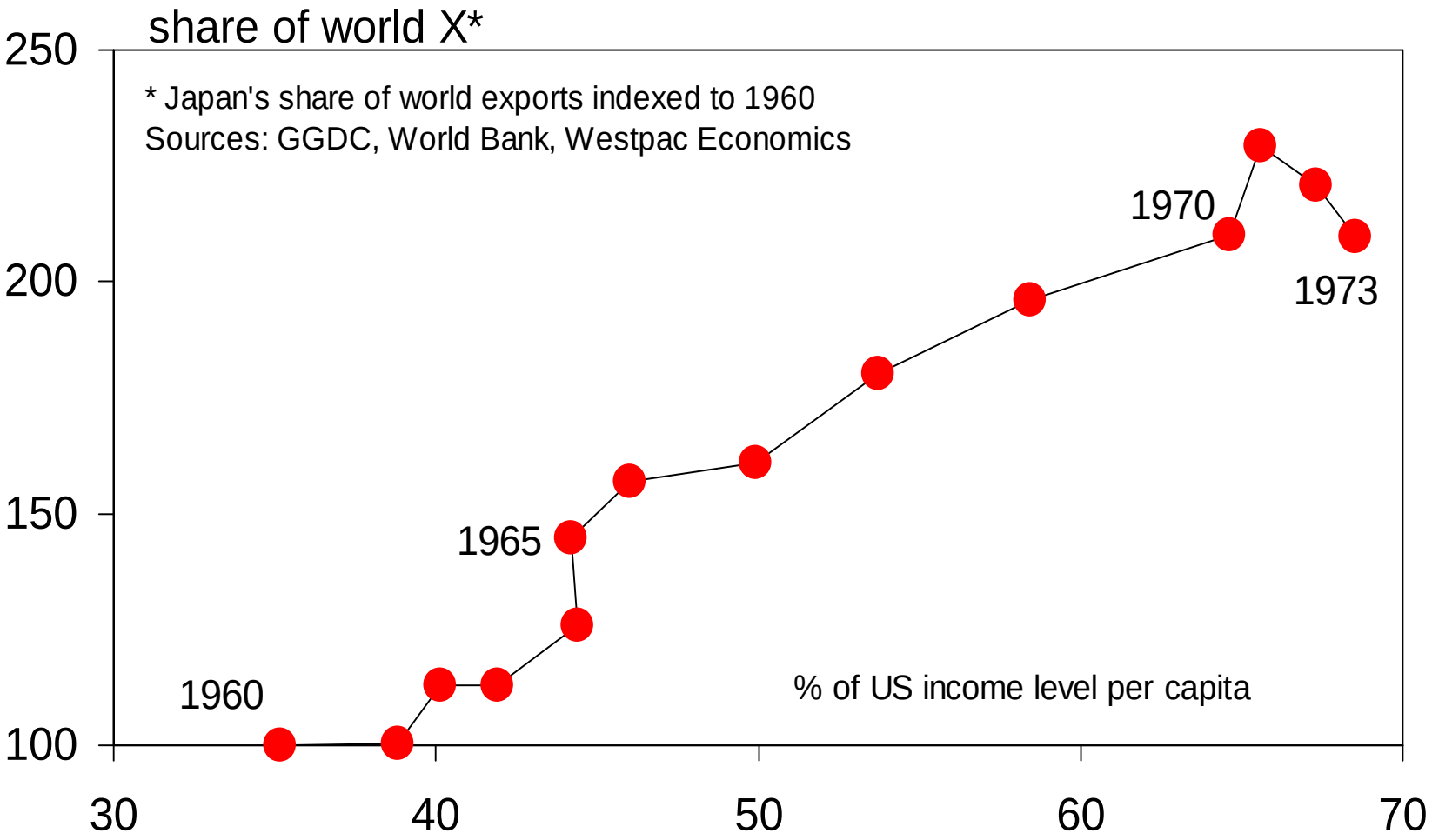


Figure 5.4: Japanese investment & capacity

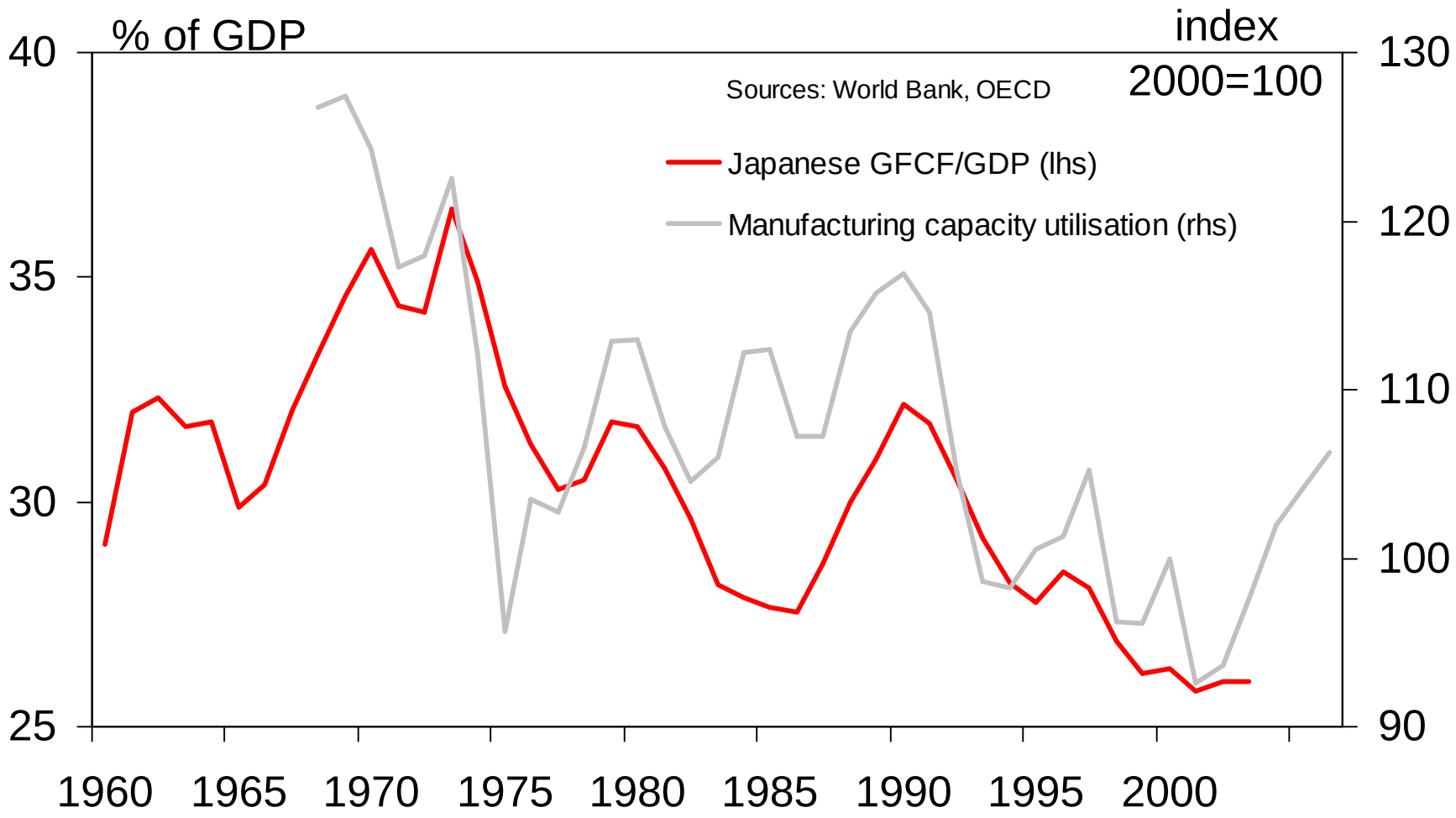


Figure 5.5: Japan's strategic pursuit 1975 to 1985

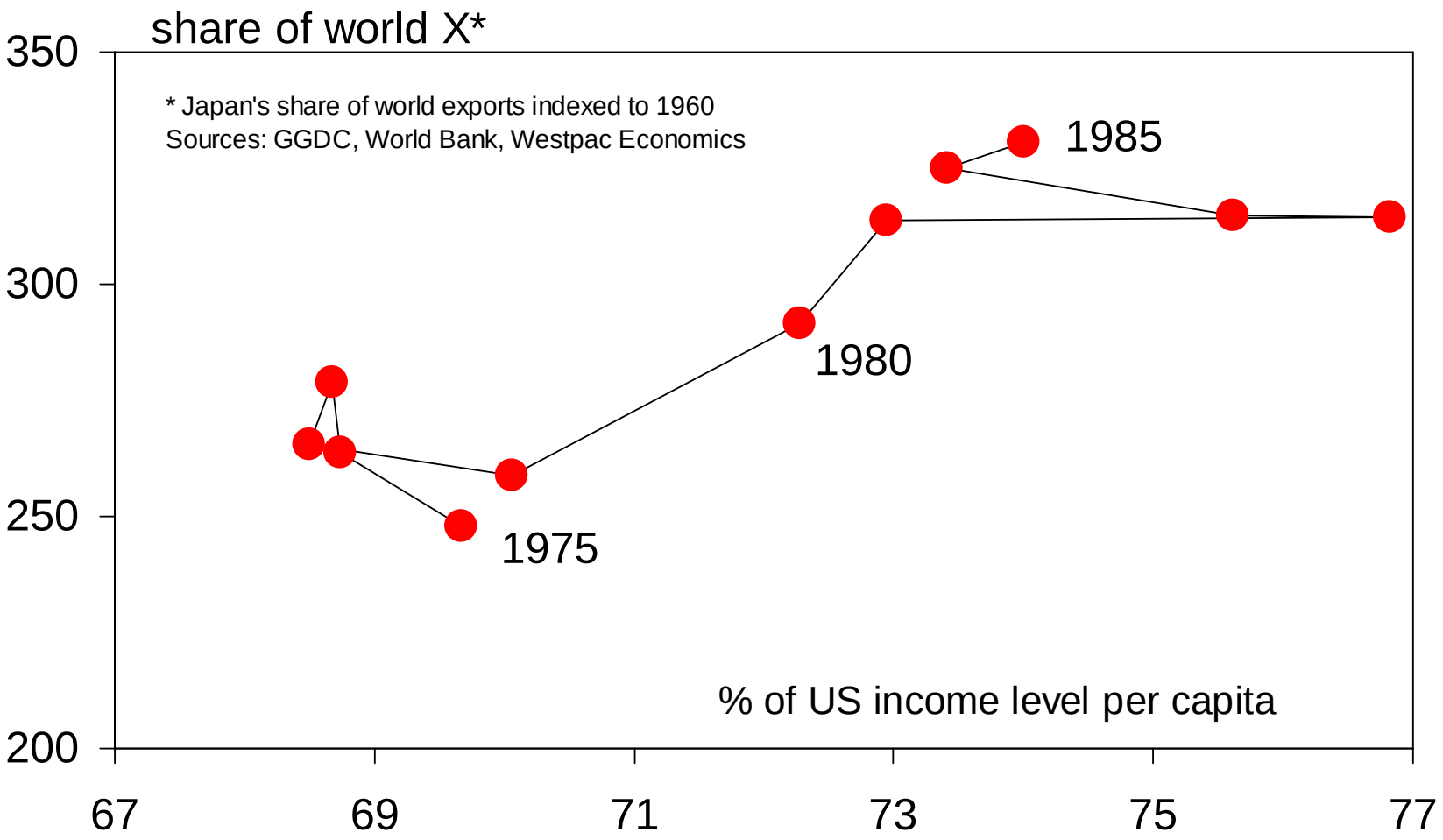


Figure 5.6: The Japanese yen over the long run

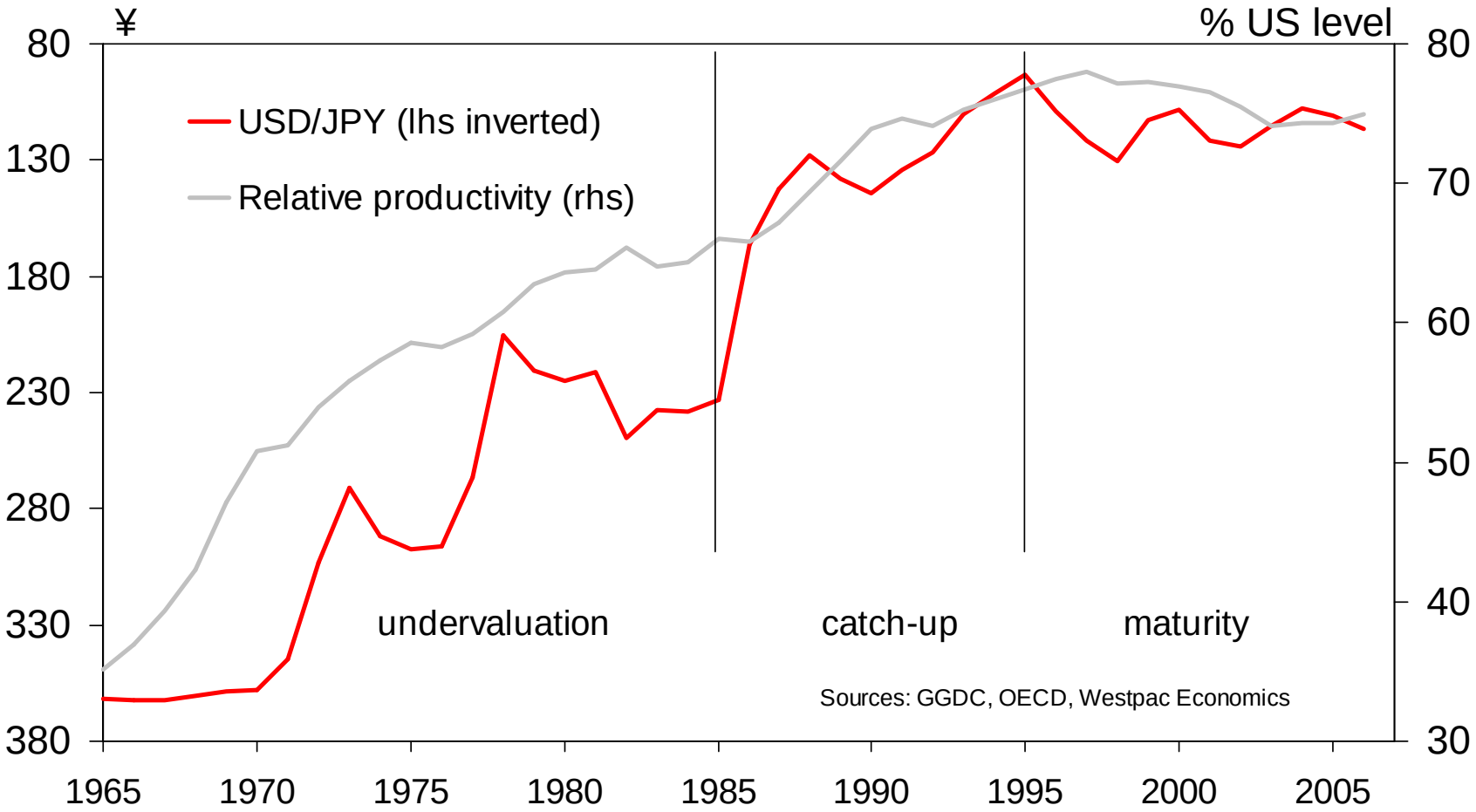


Figure 5.7: Japan's strategic pursuit 1985 to 1990

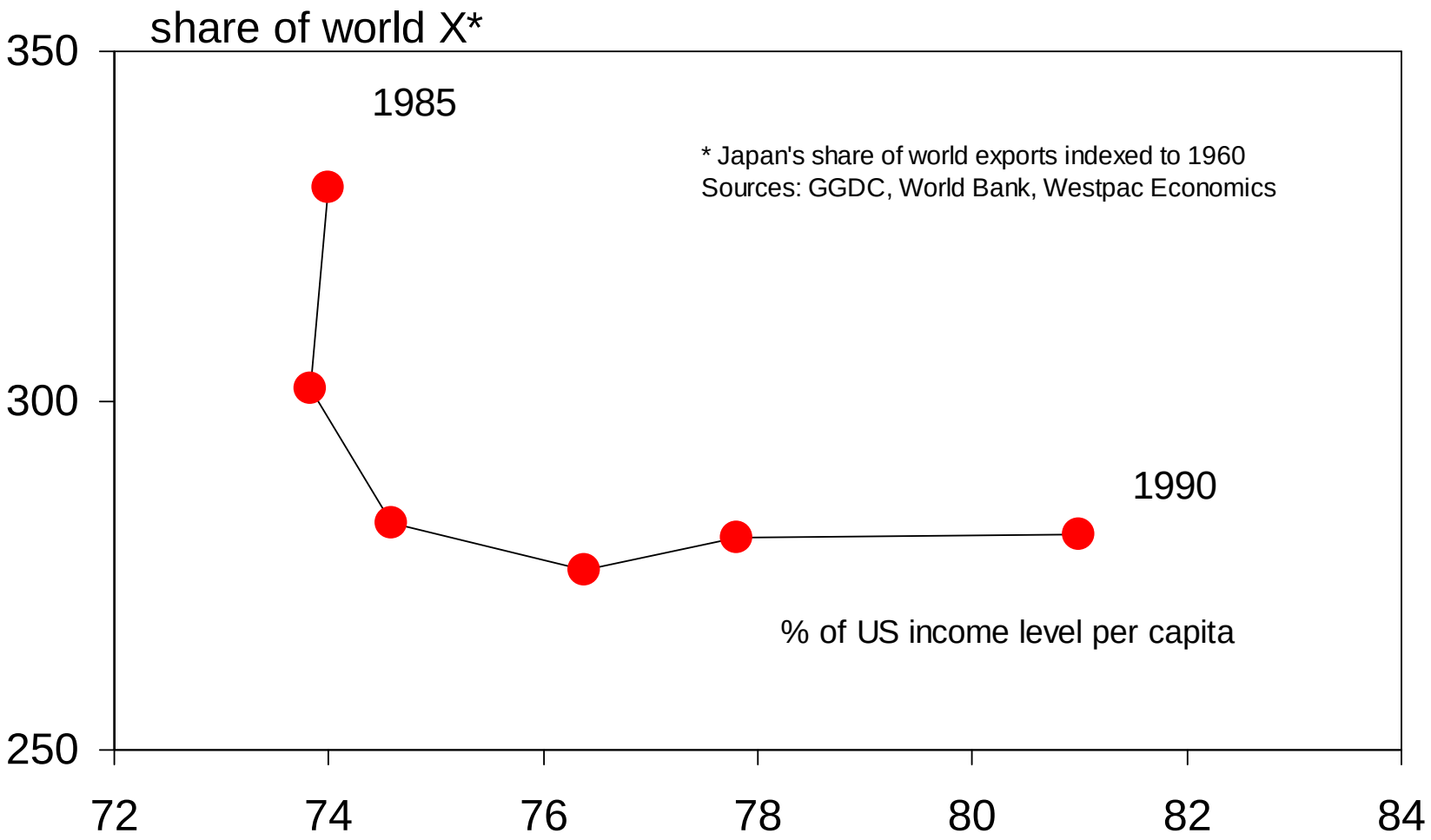


Figure 5.8: A false signal to Japan's strategists

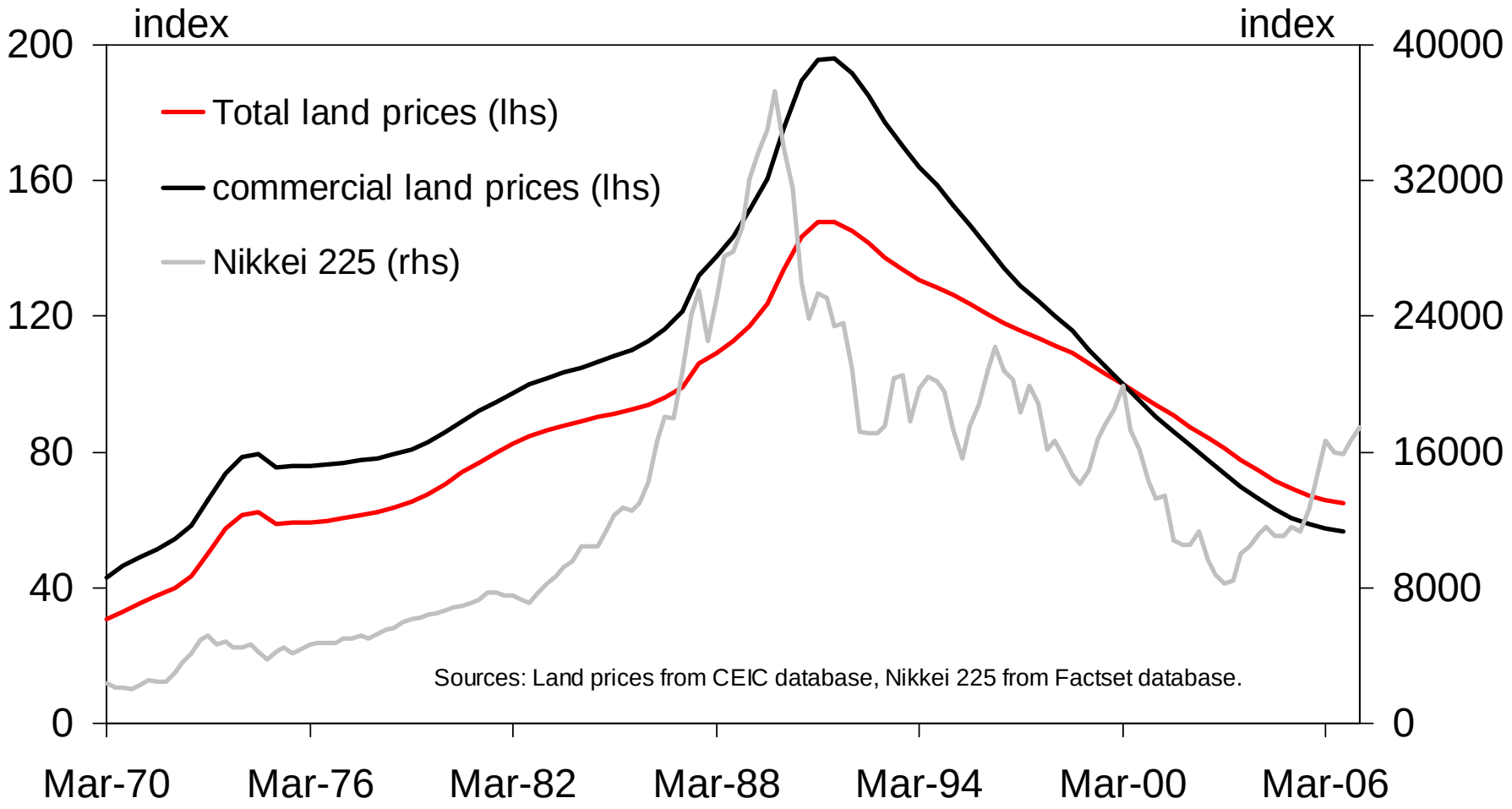


Figure 5.9: Japan's strategic administration errs

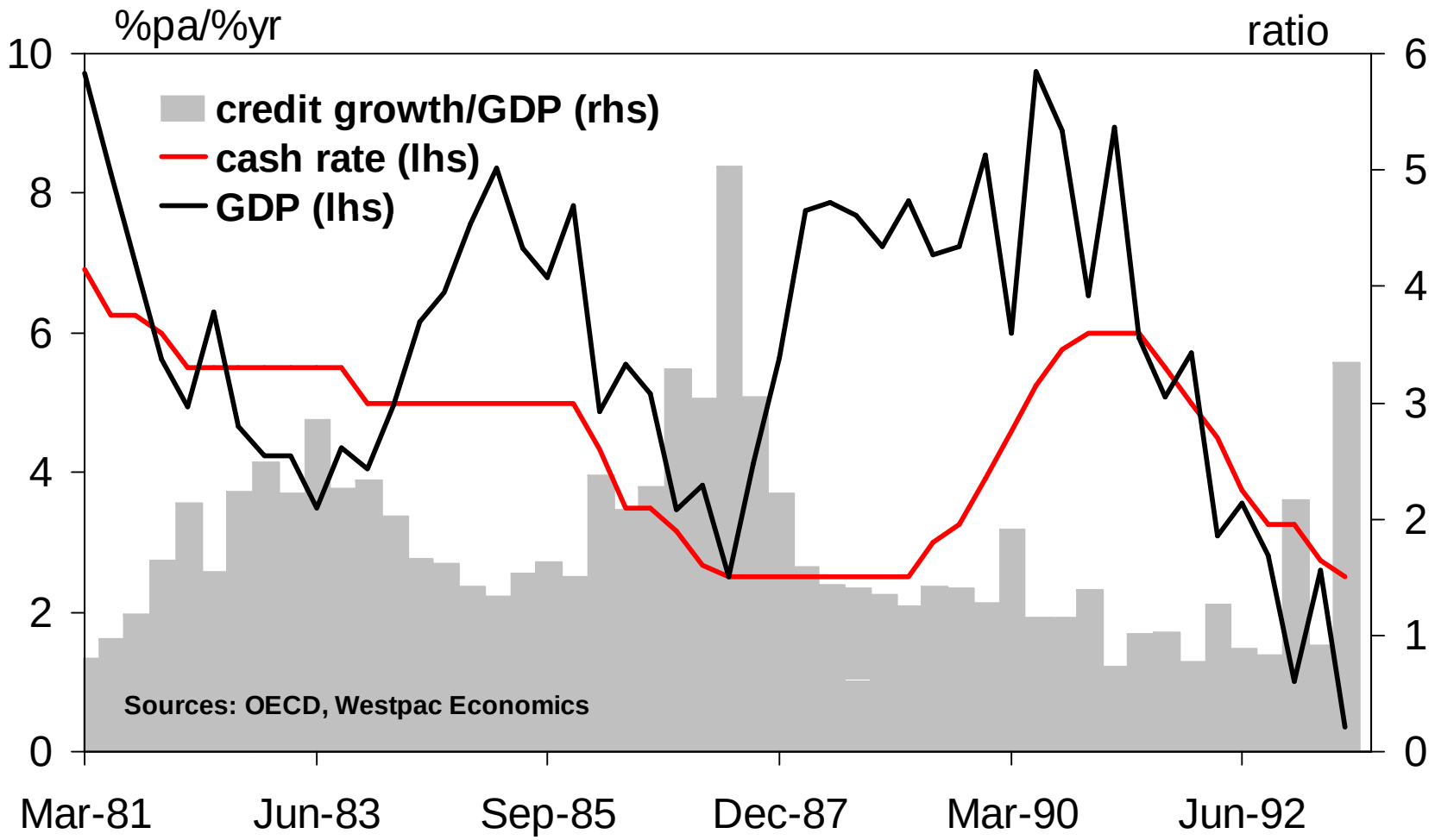


Figure 5.10: The crash of strategic confidence

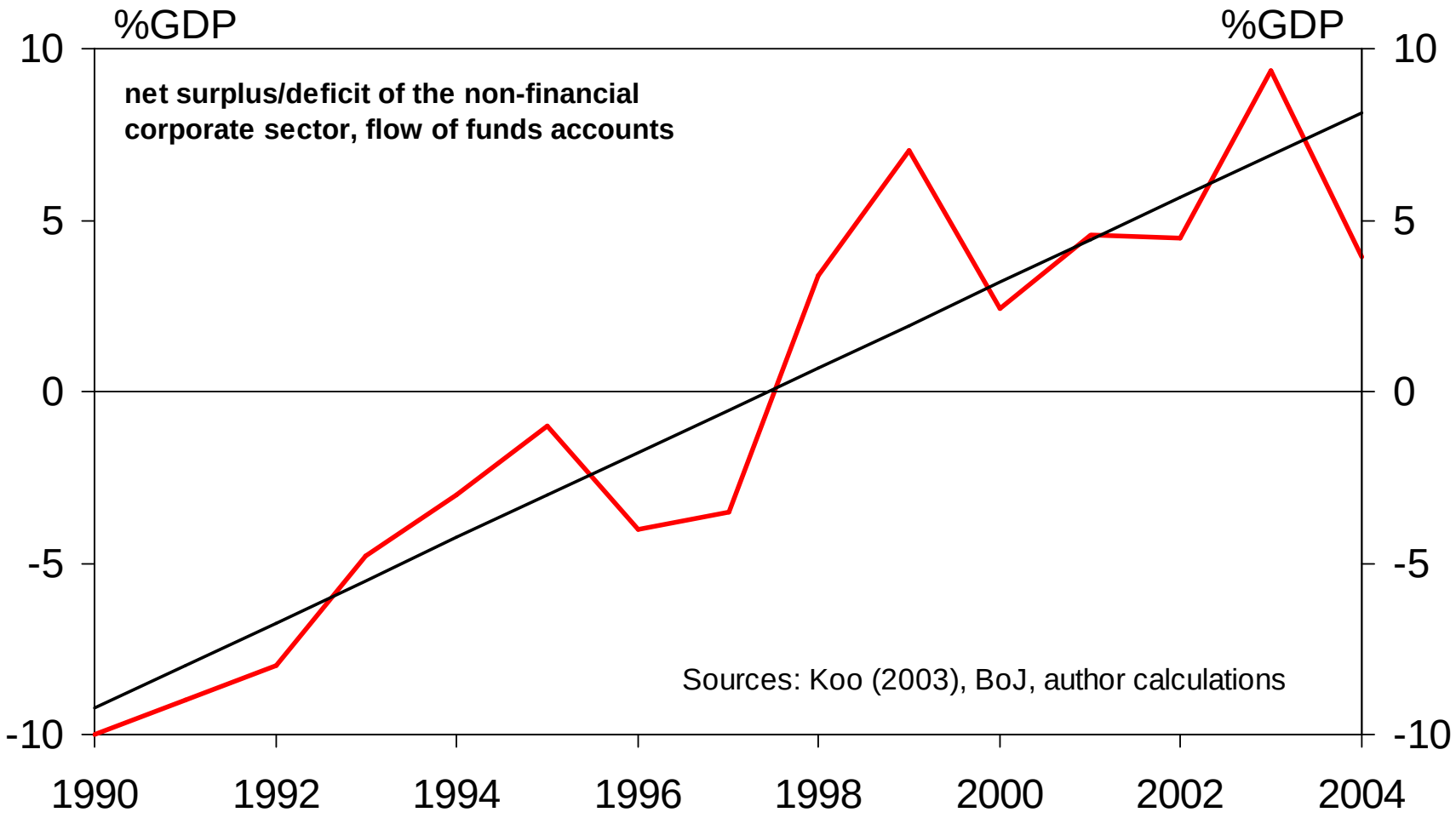
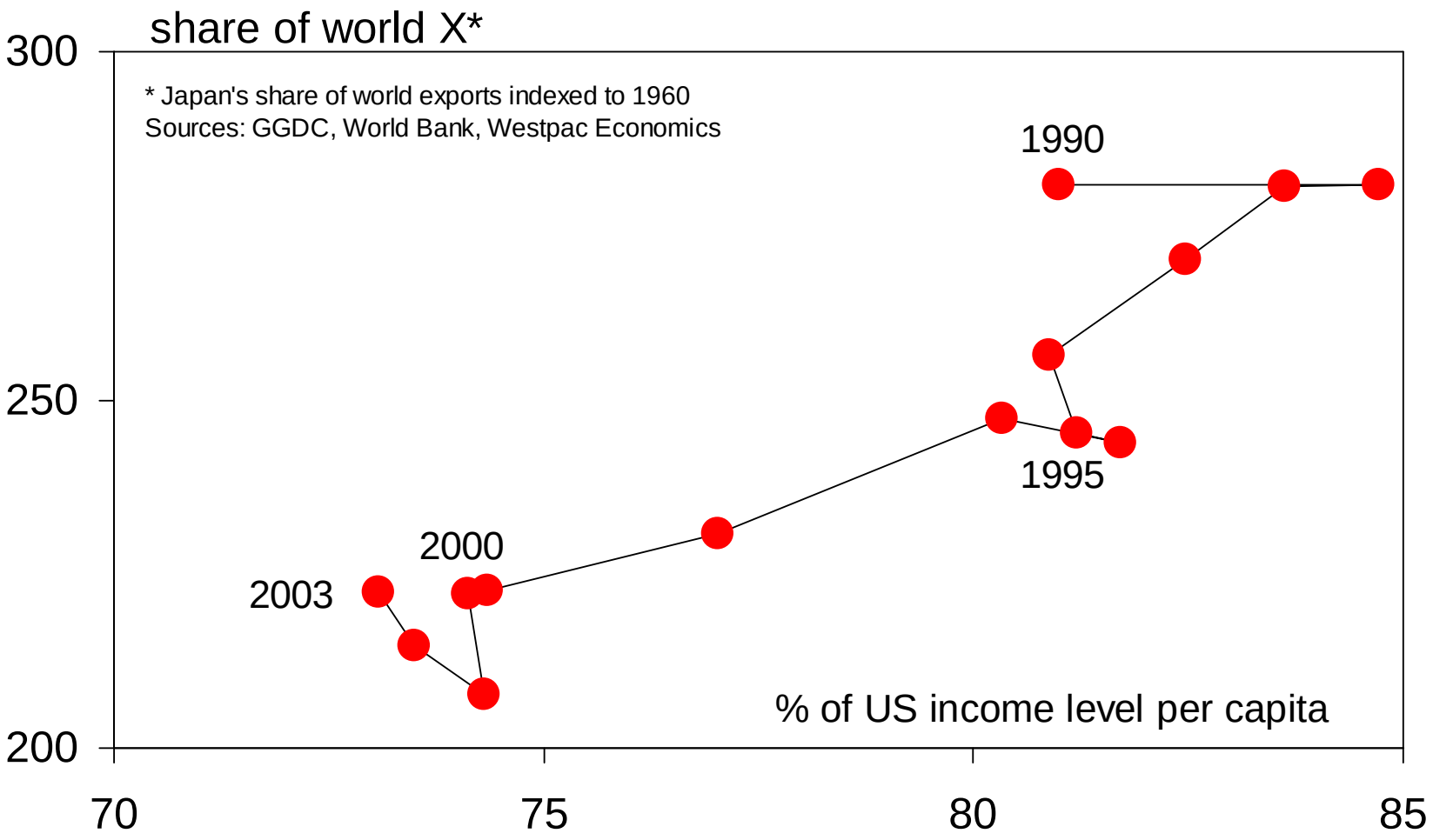


Figure 5.11: Japan's strategic pursuit after 1990



Section six

China

Figure 6.1: China's strategic pursuit since 1978

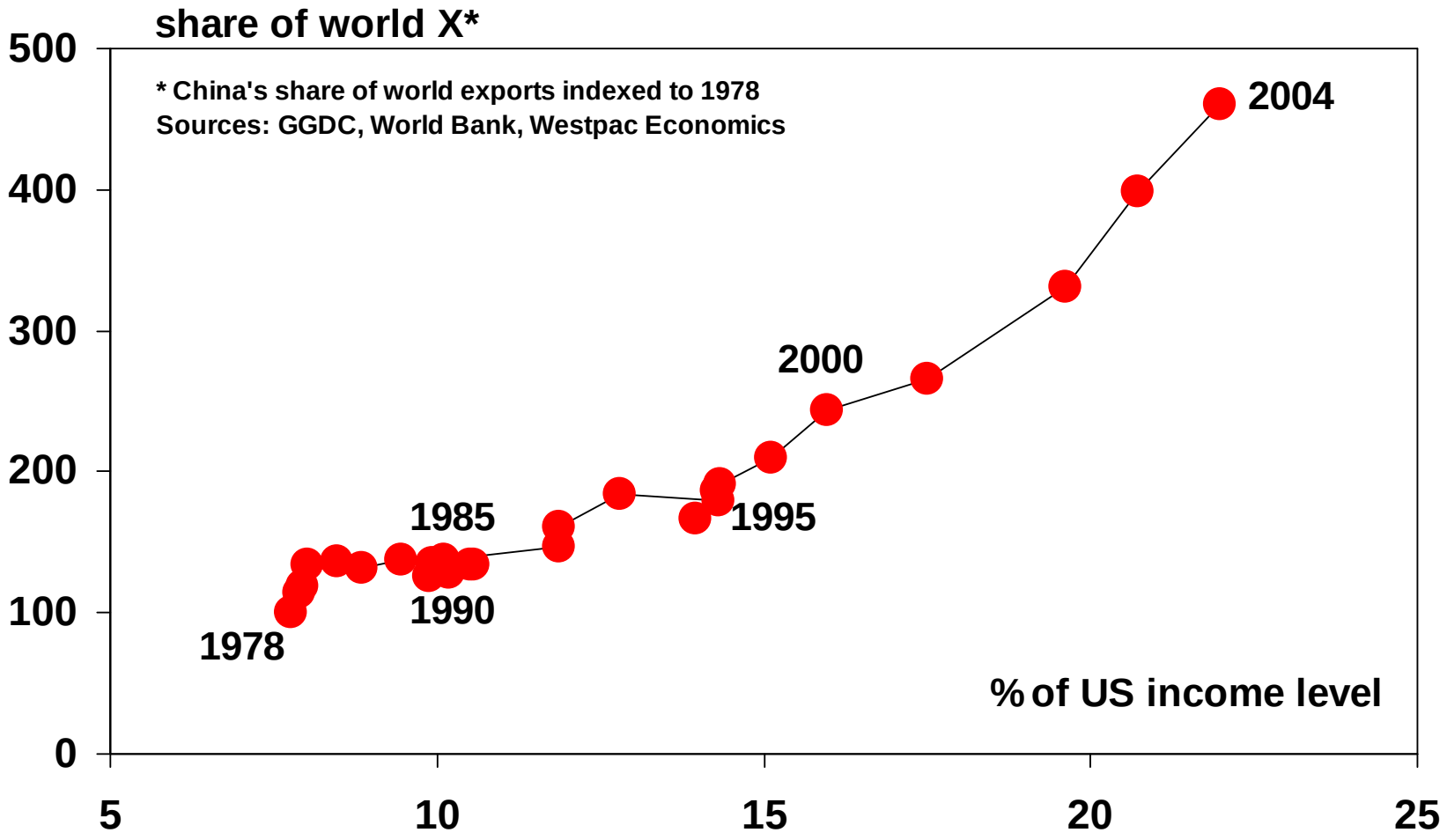


Figure 6.2.i: China's strategic pursuit 1978 to 1990

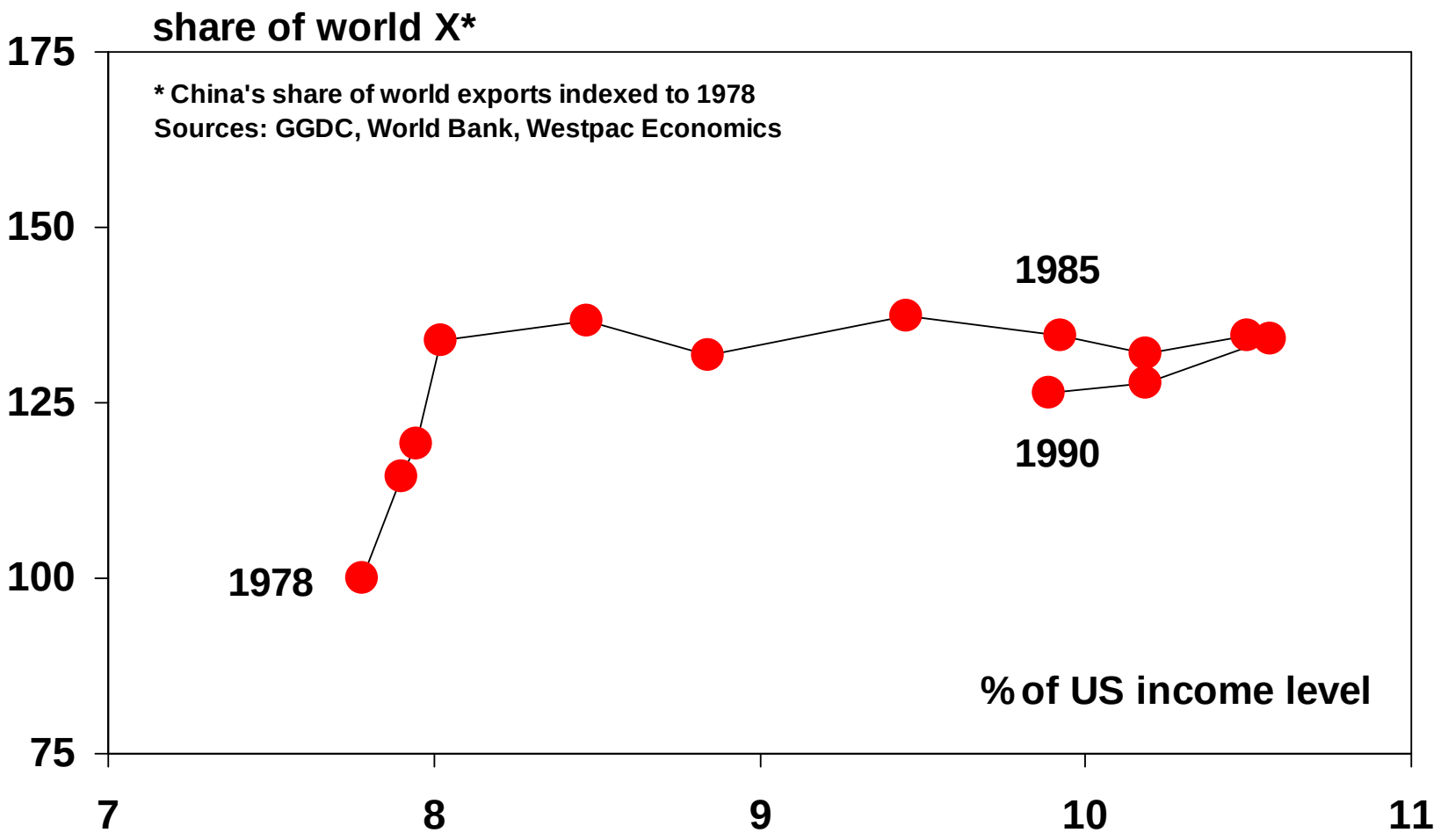


Figure 6.2.ii: China's strategic pursuit in the 1990s

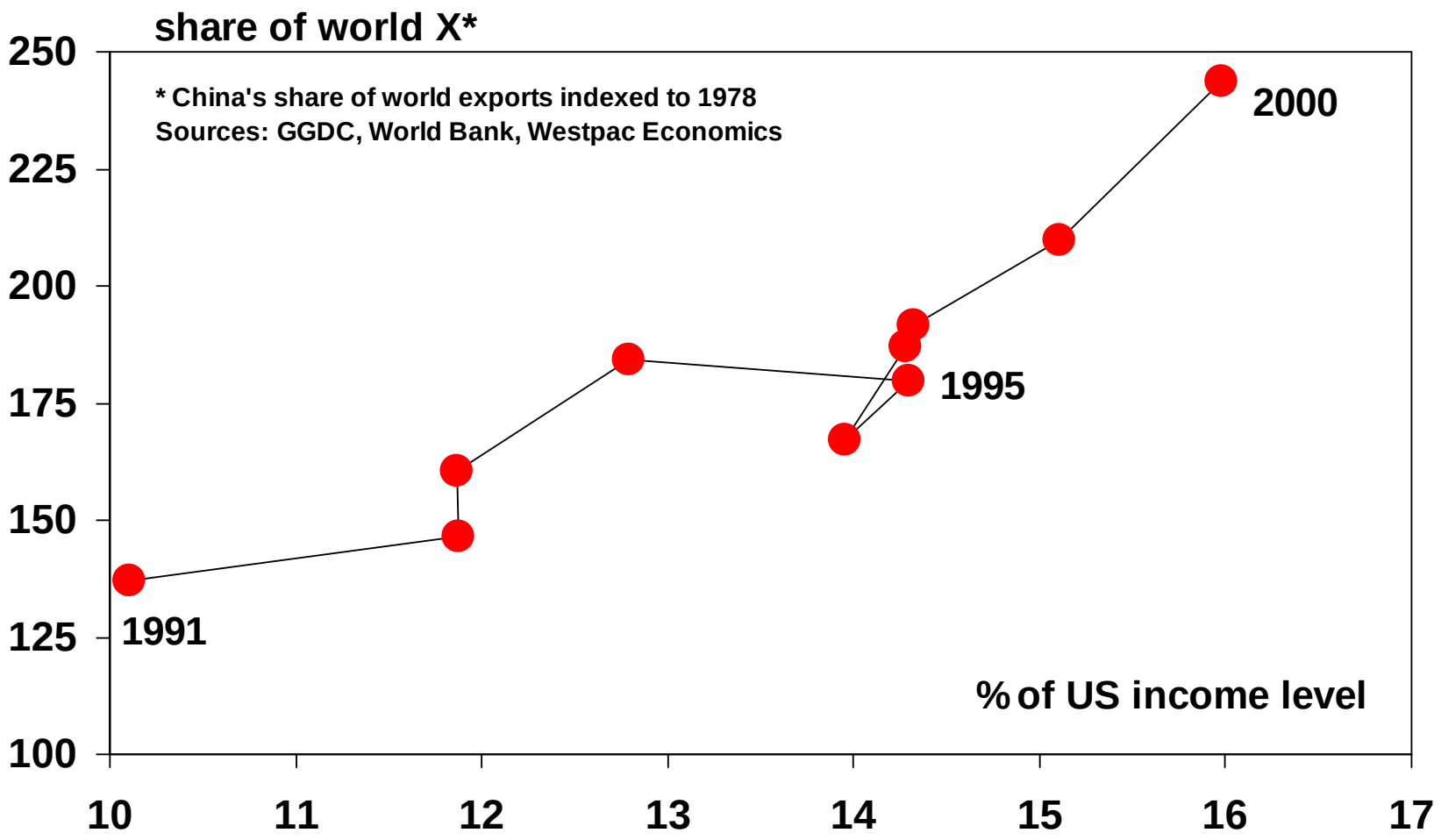


Figure 6.2.iii: China's strategic pursuit since 1999

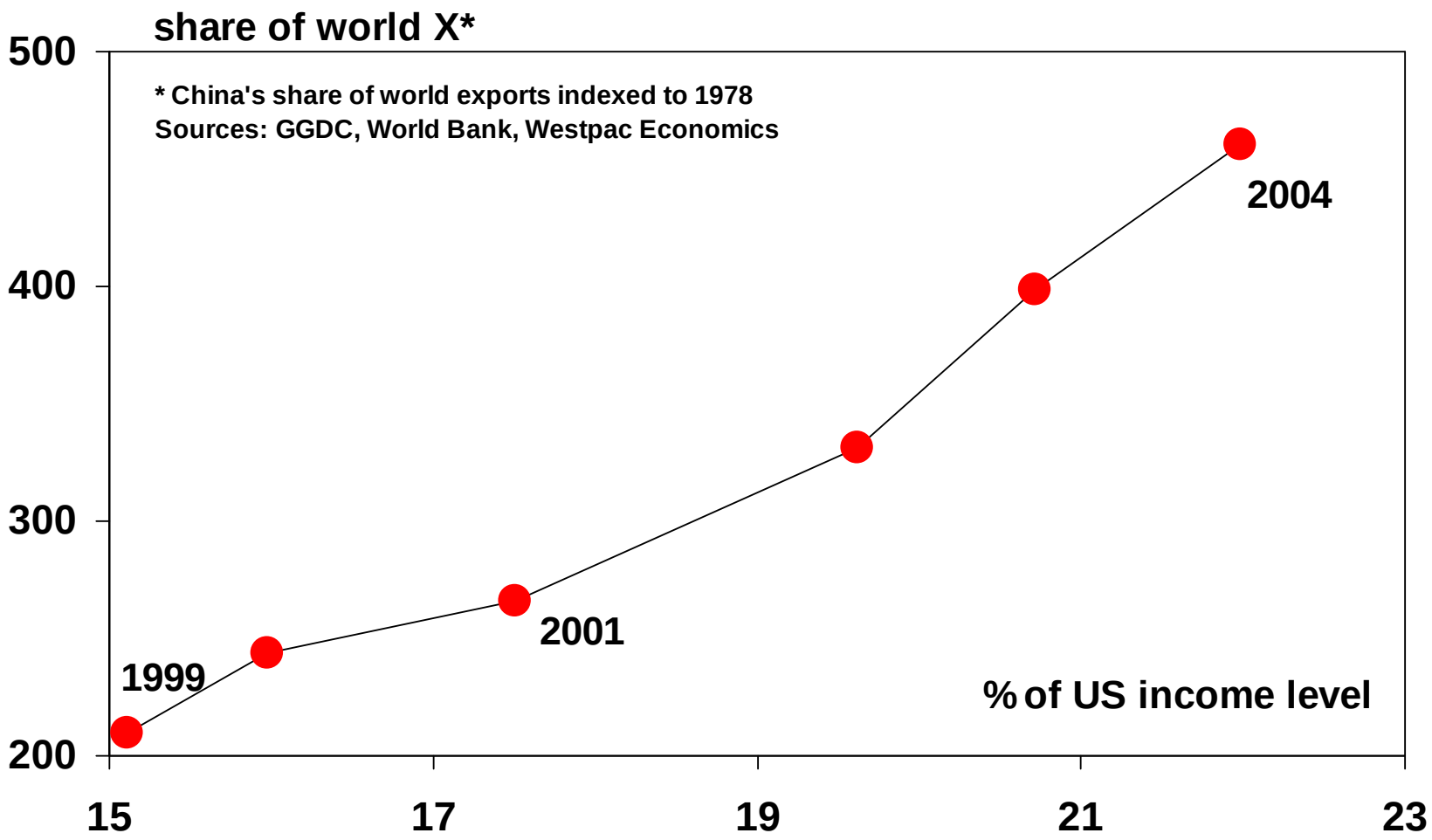


Figure 6.3: Net exports & Chinese growth

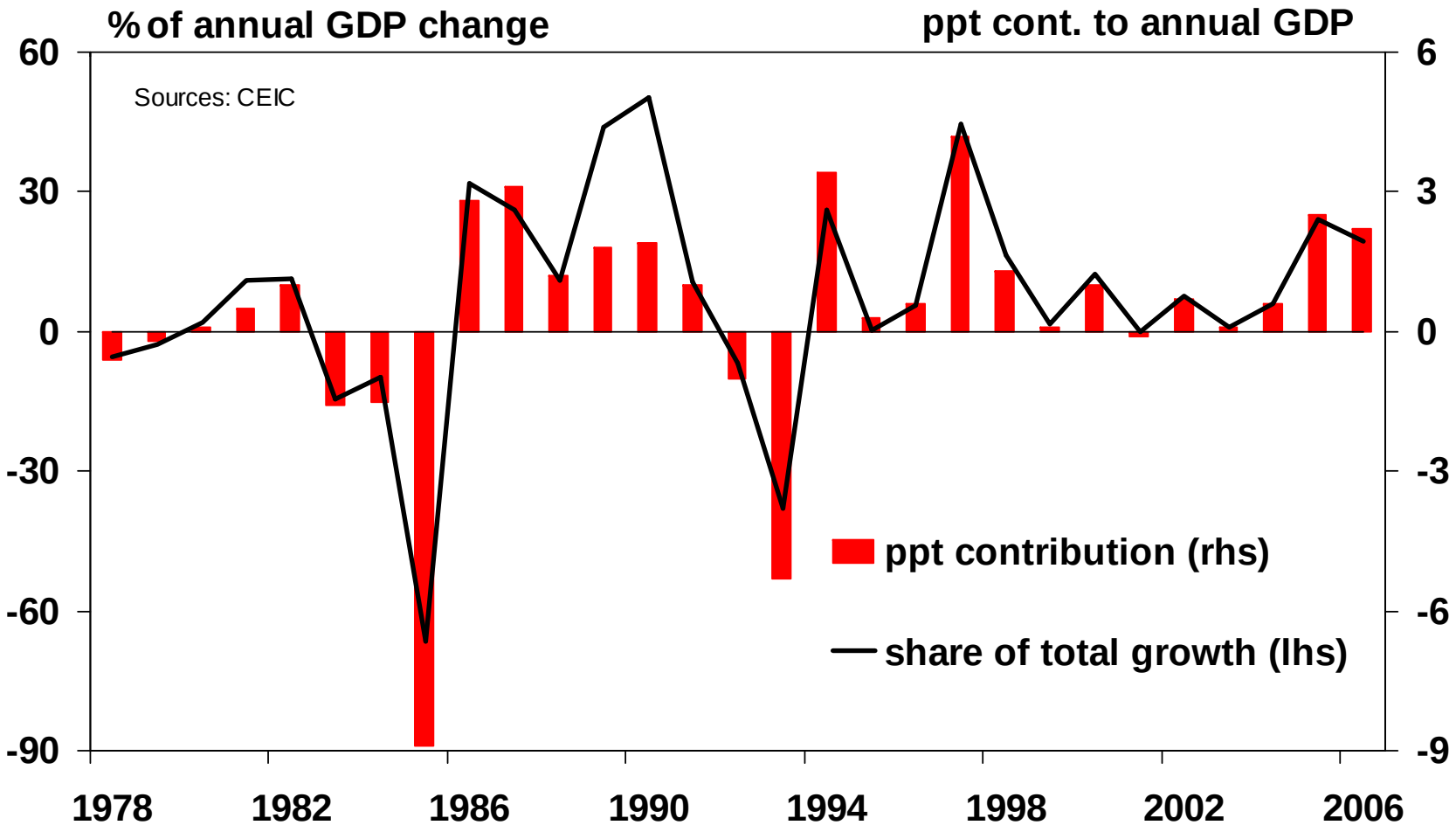


Figure 6.4: China's exports climb the ladder

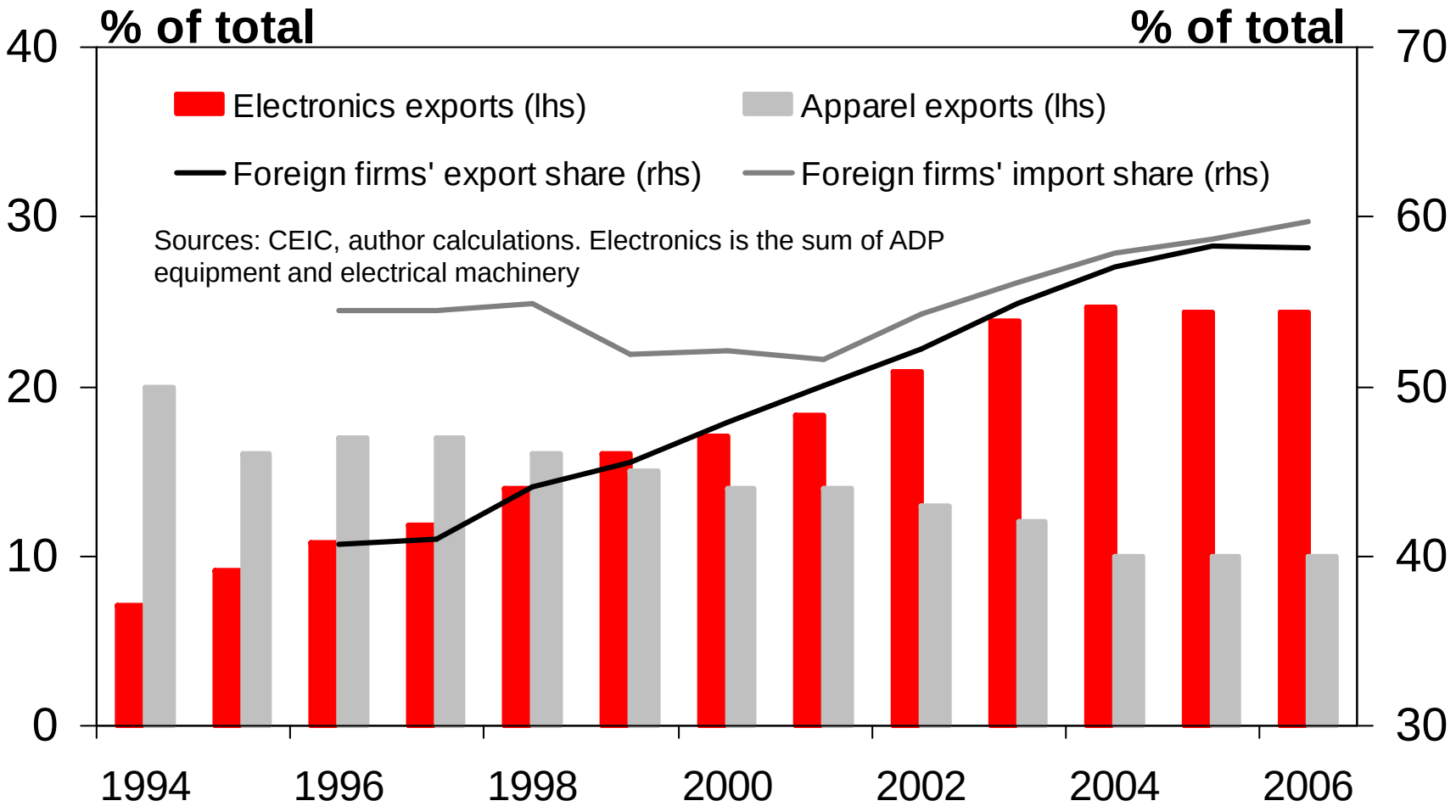


Figure 6.5: China's adjusted export share

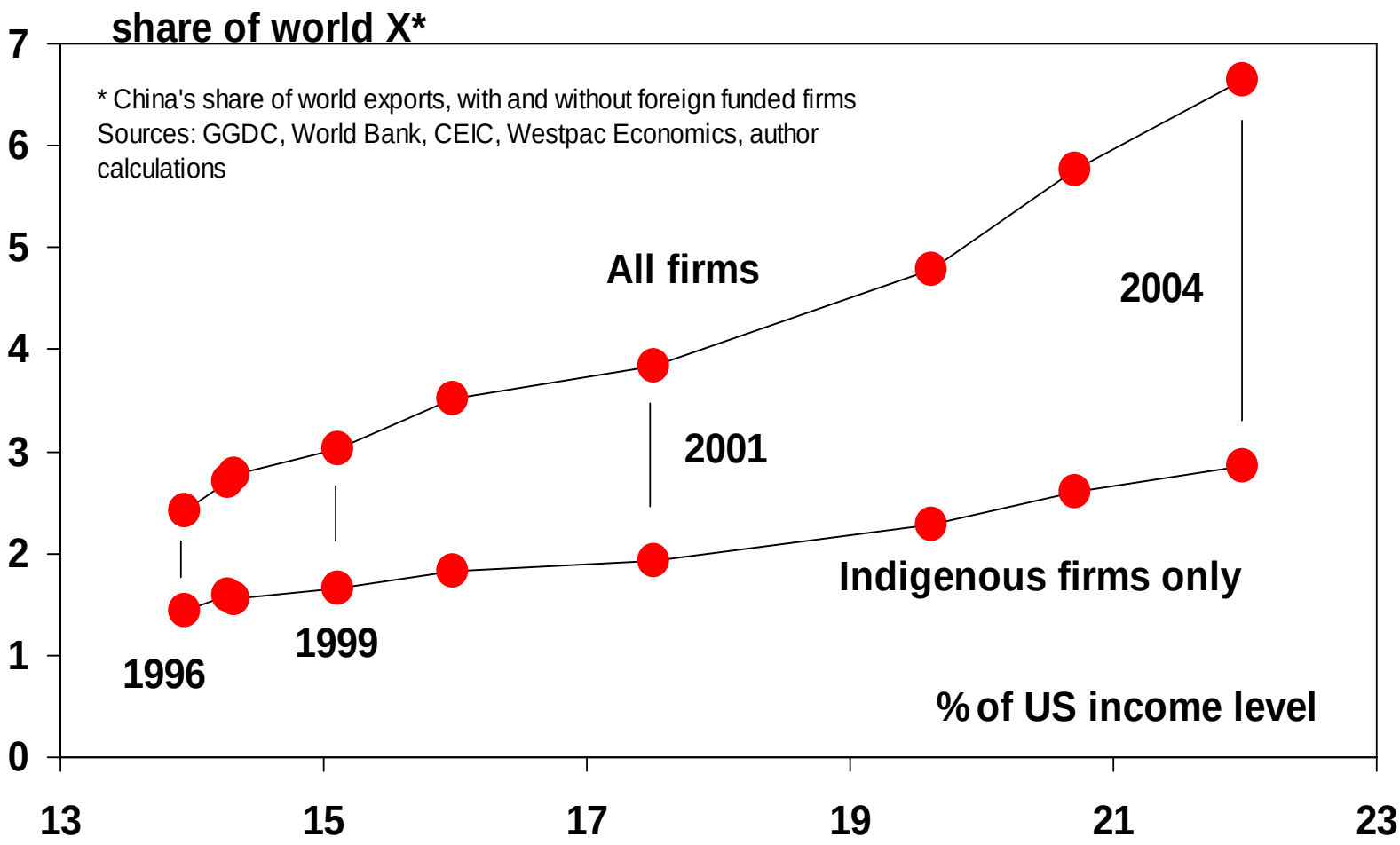


Figure 6.6: Distance from the strategic leader

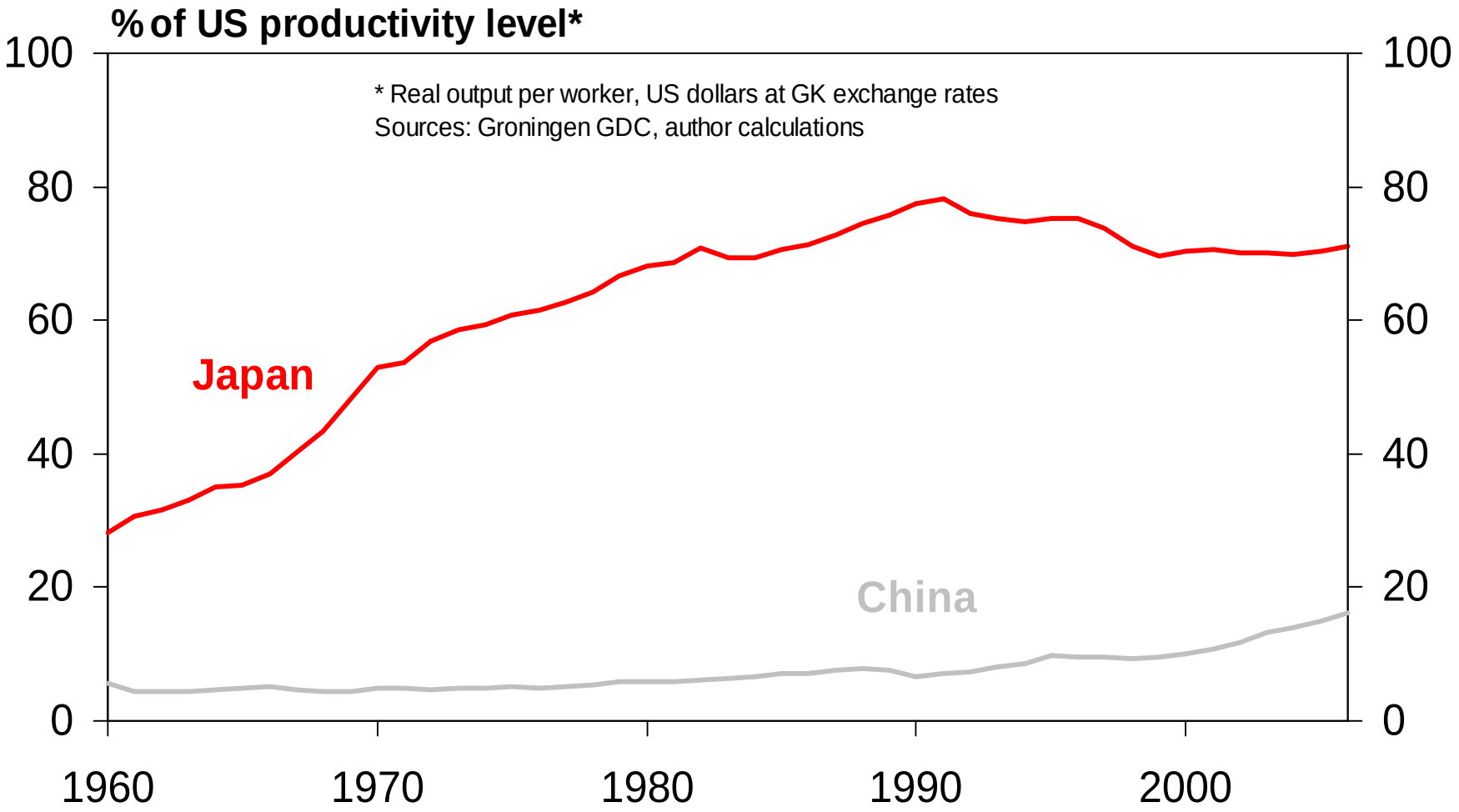


Figure 6.7: Actual & projected urbanisation rates

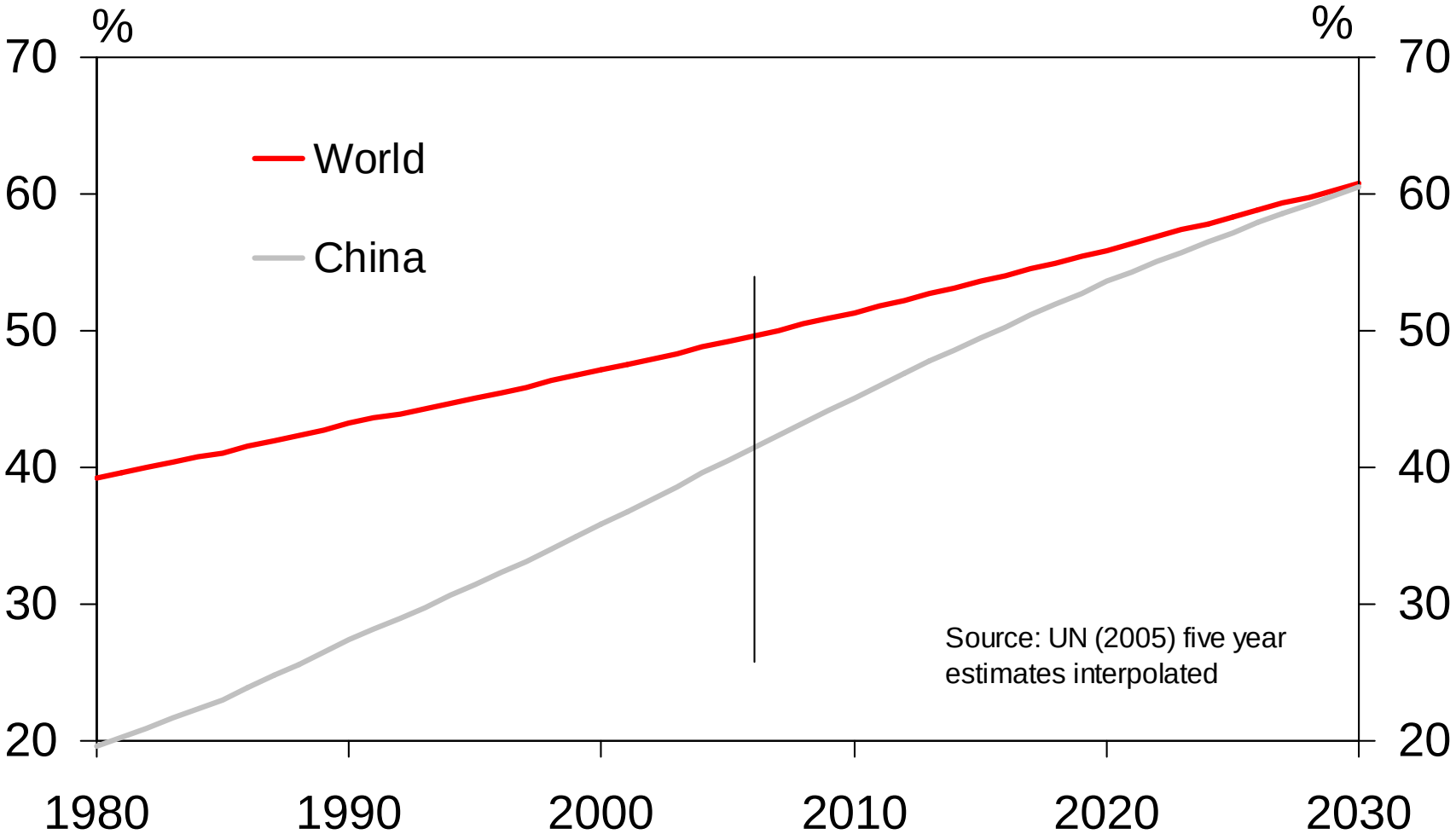


Figure 6.8: Urbanisation as a source of growth

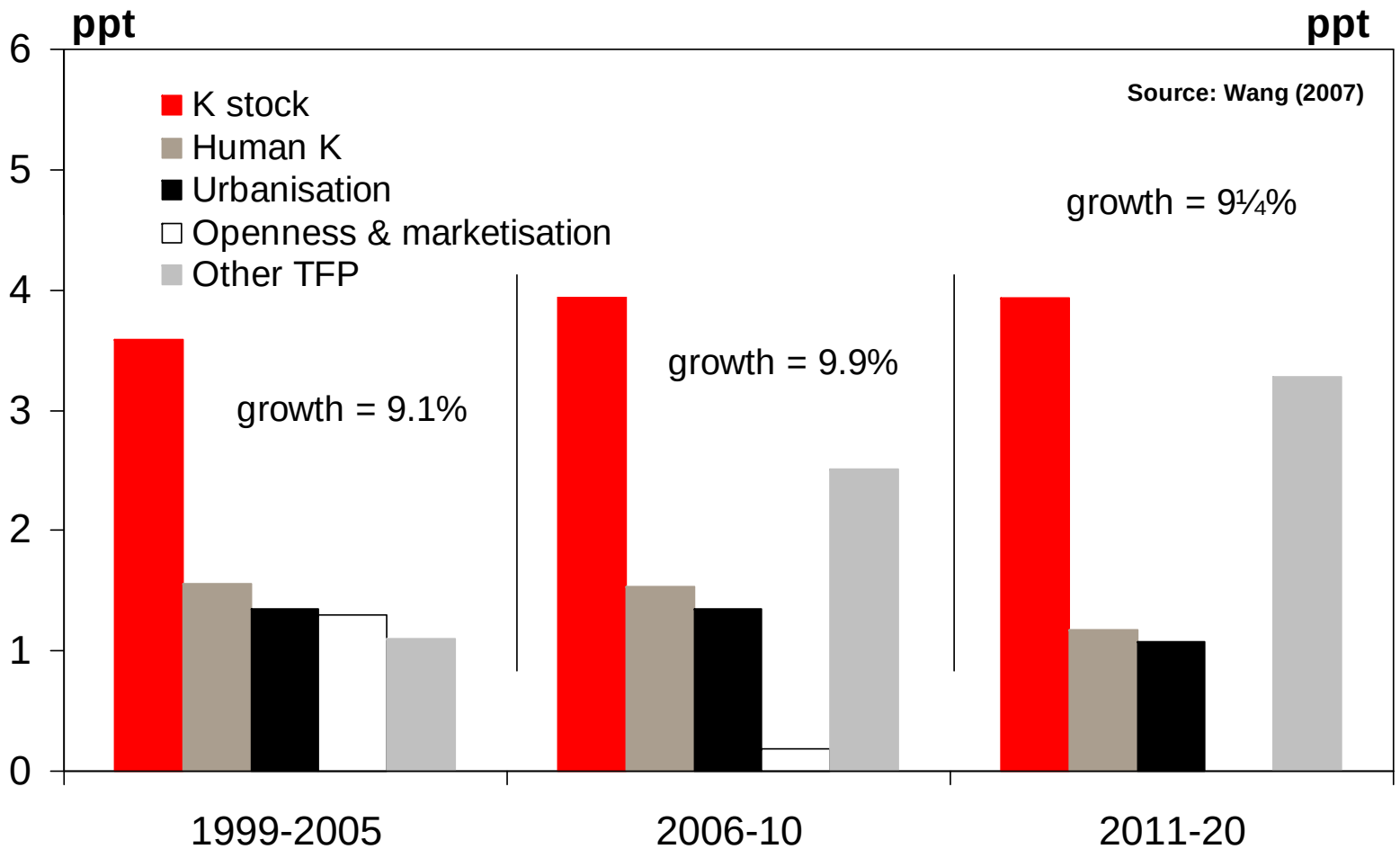


Figure 6.9.i: China's population in 2000

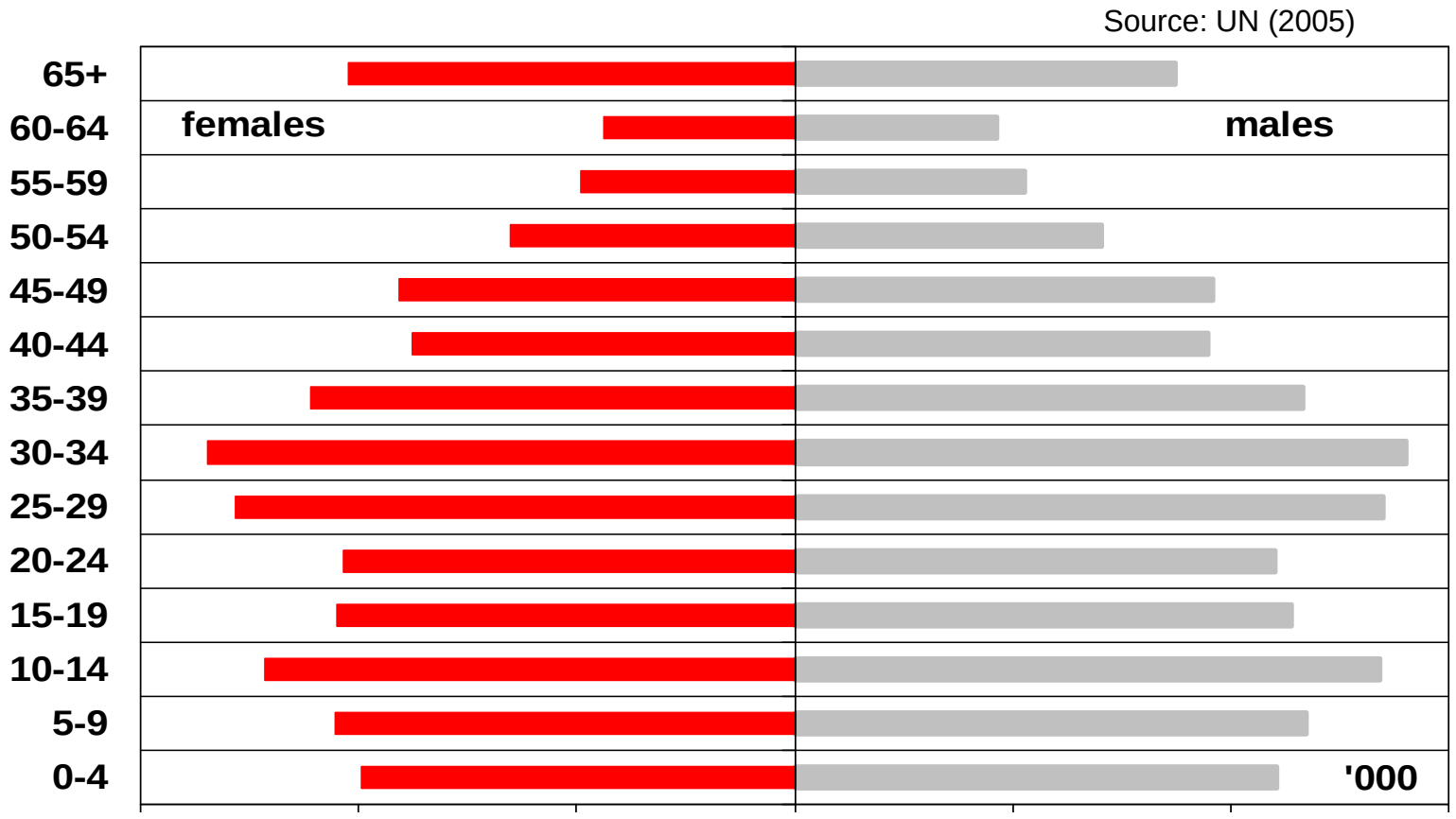


Figure 6.9.ii: China's population in 2030

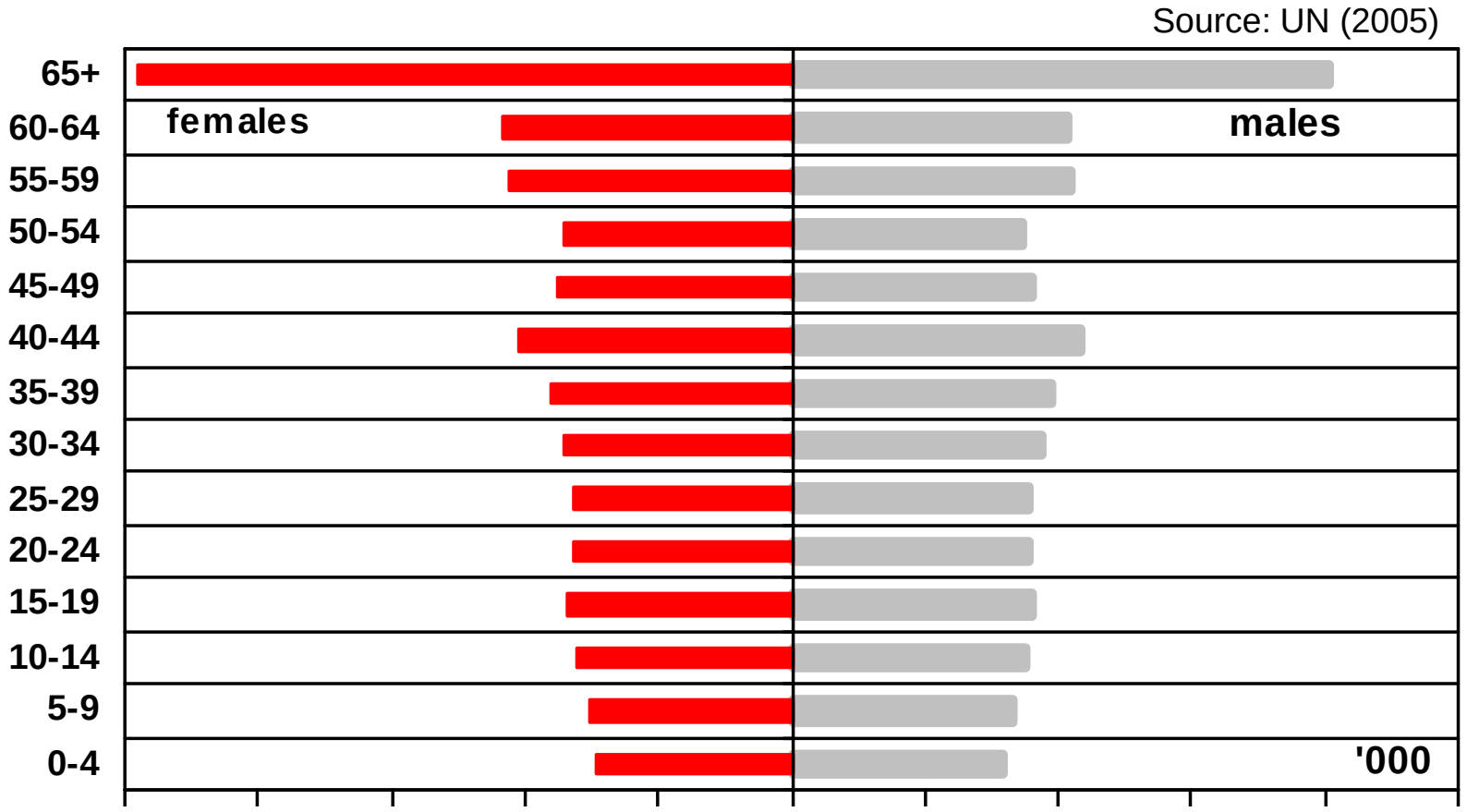


Figure 6.10: Chinese market integration proxies

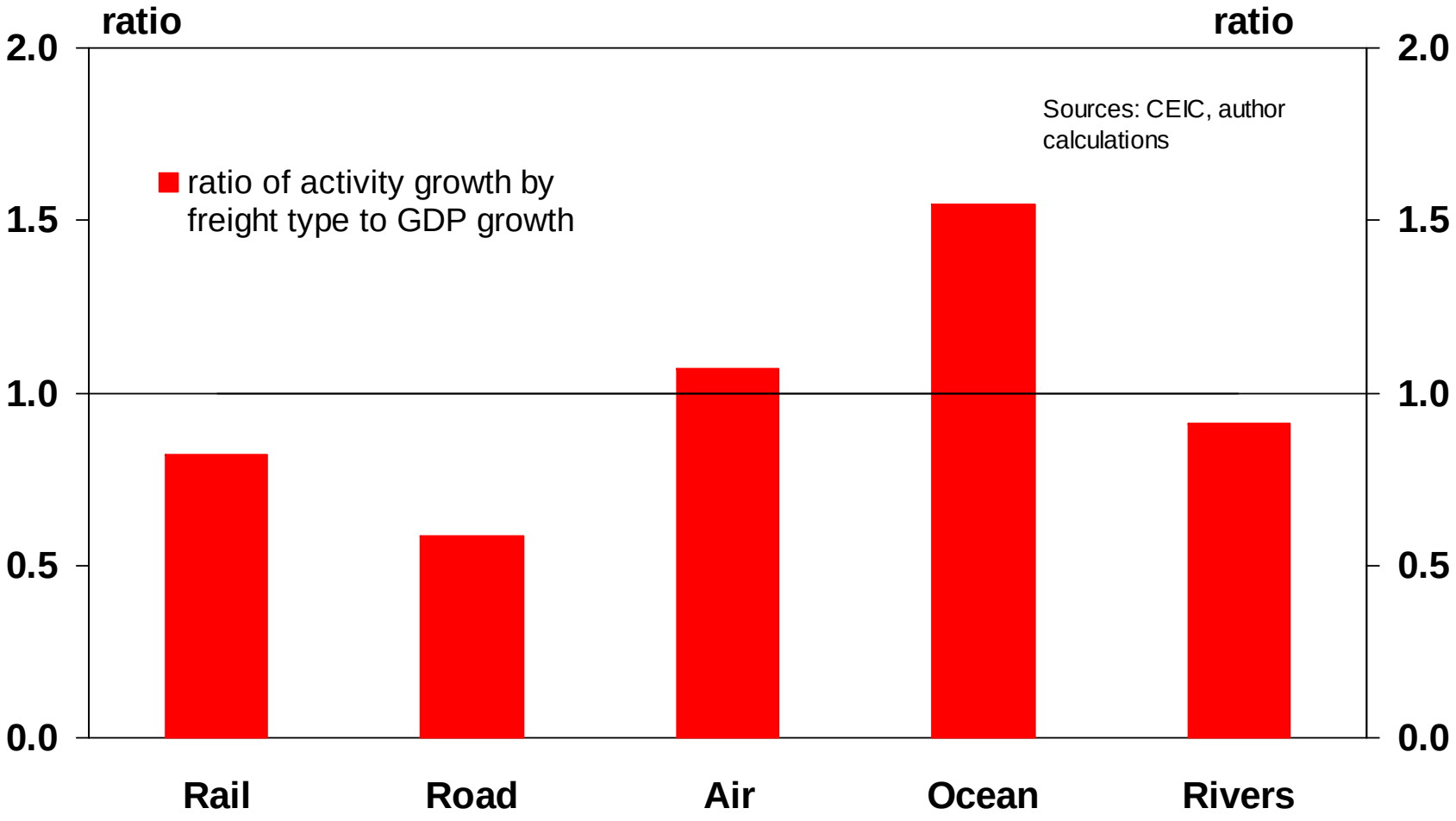


Figure 6.11: China's prospective middle class

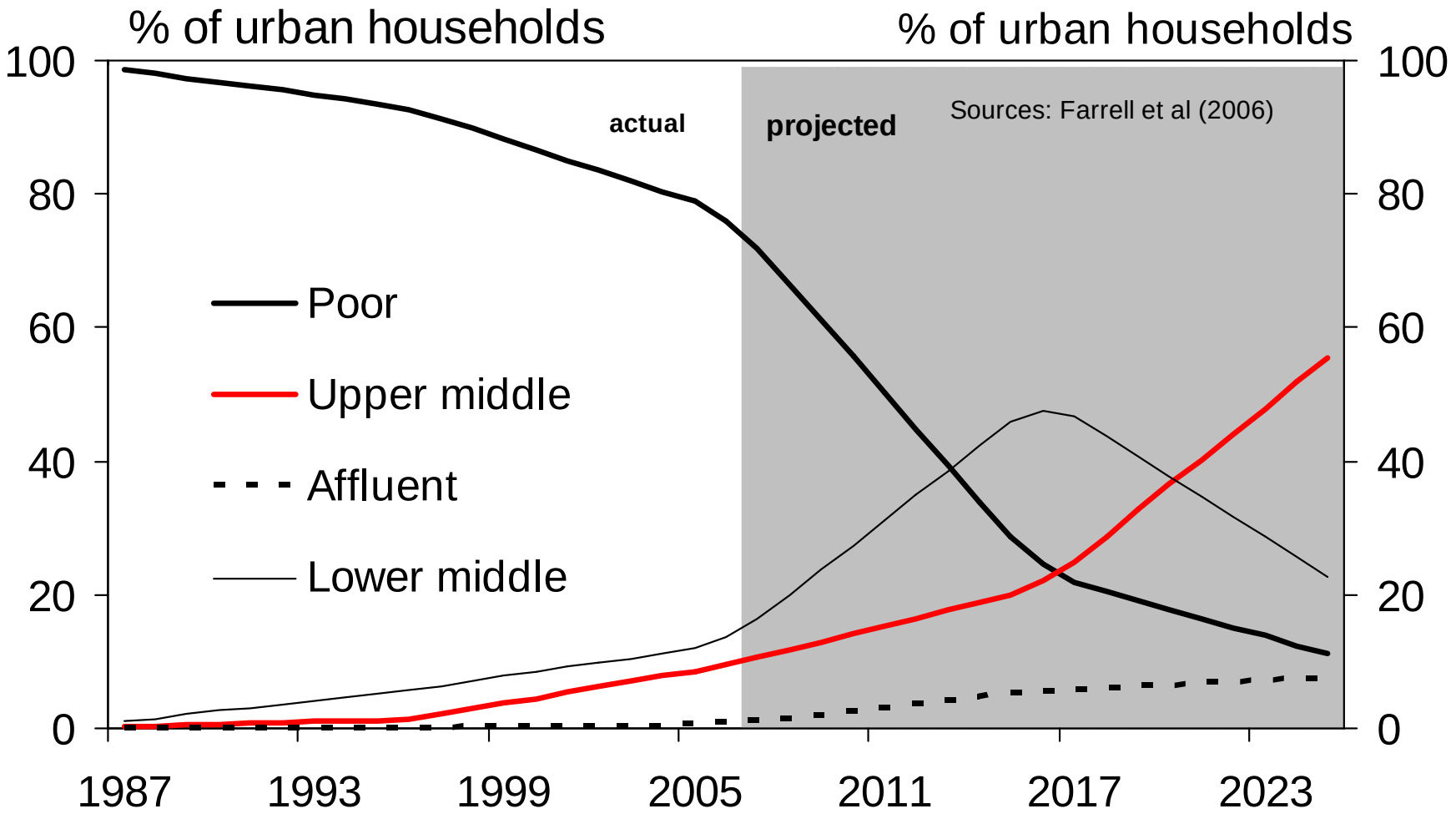
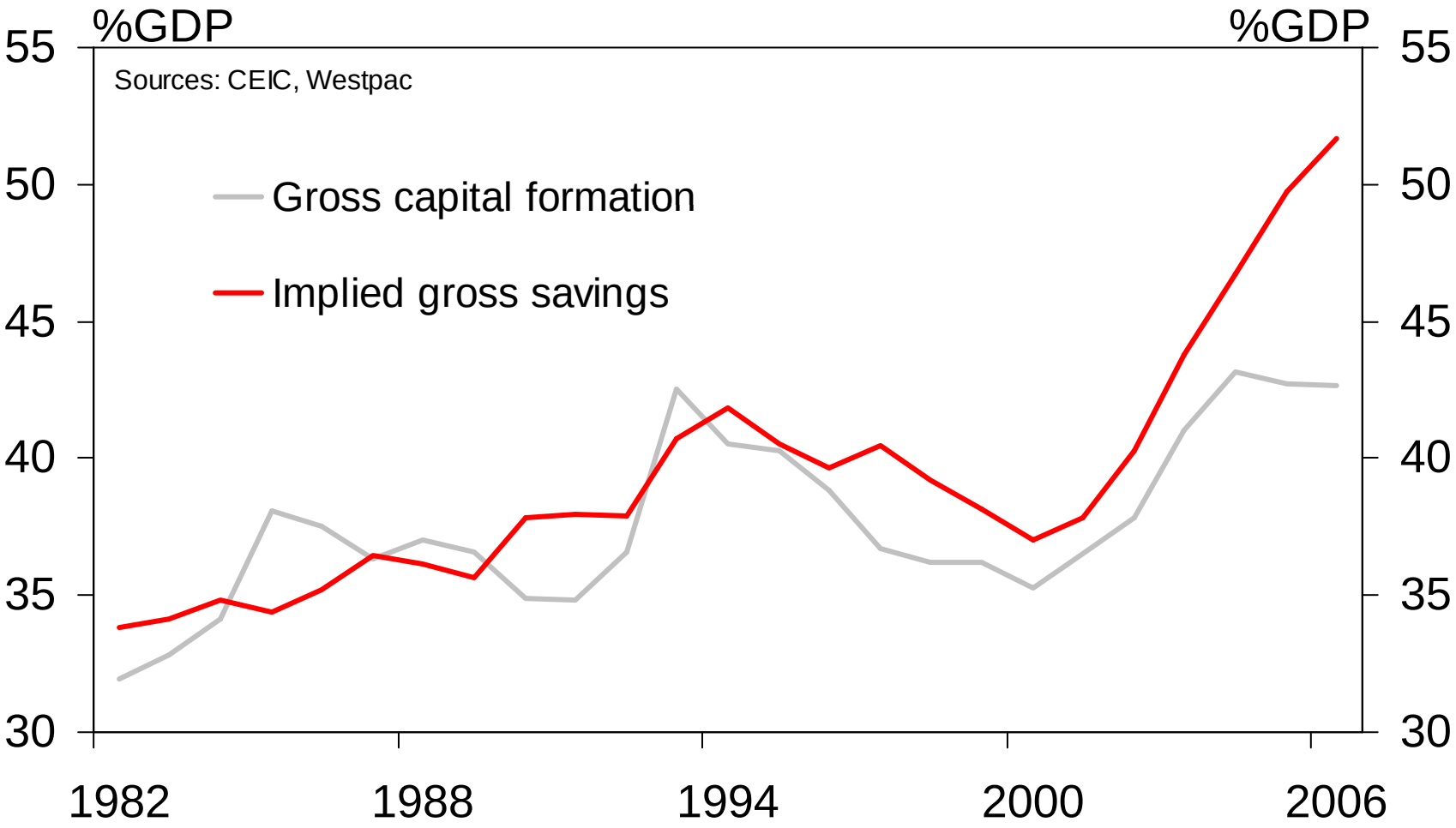


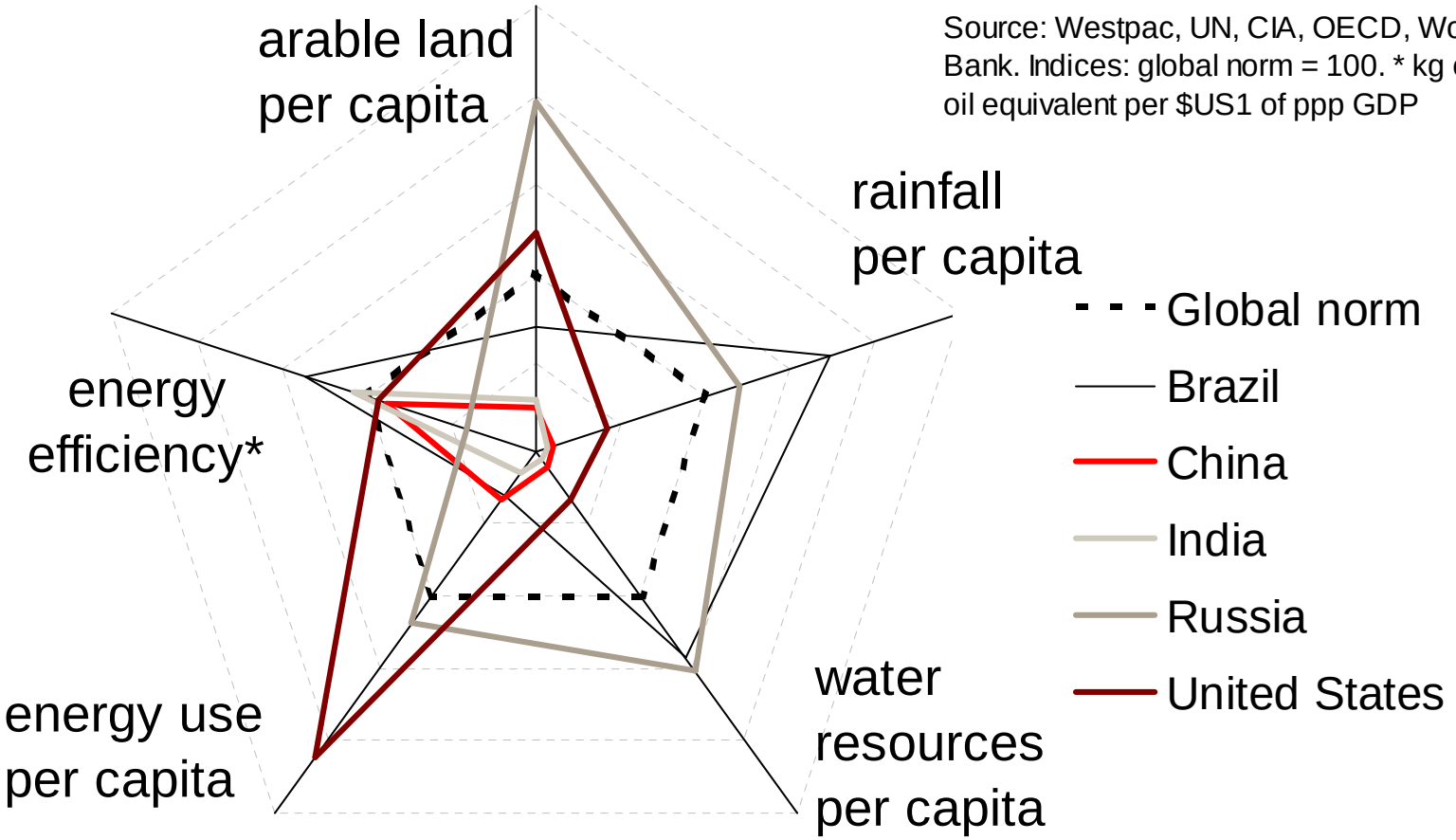
Figure 6.12: Chinese savings and investment



Section seven

China: the risks

Figure 7.1: Food, energy & water security



Source: Westpac, UN, CIA, OECD, World Bank. Indices: global norm = 100. * kg of oil equivalent per $US1 of ppp GDP

Figure 7.2: Populous nations lag since late 1700s

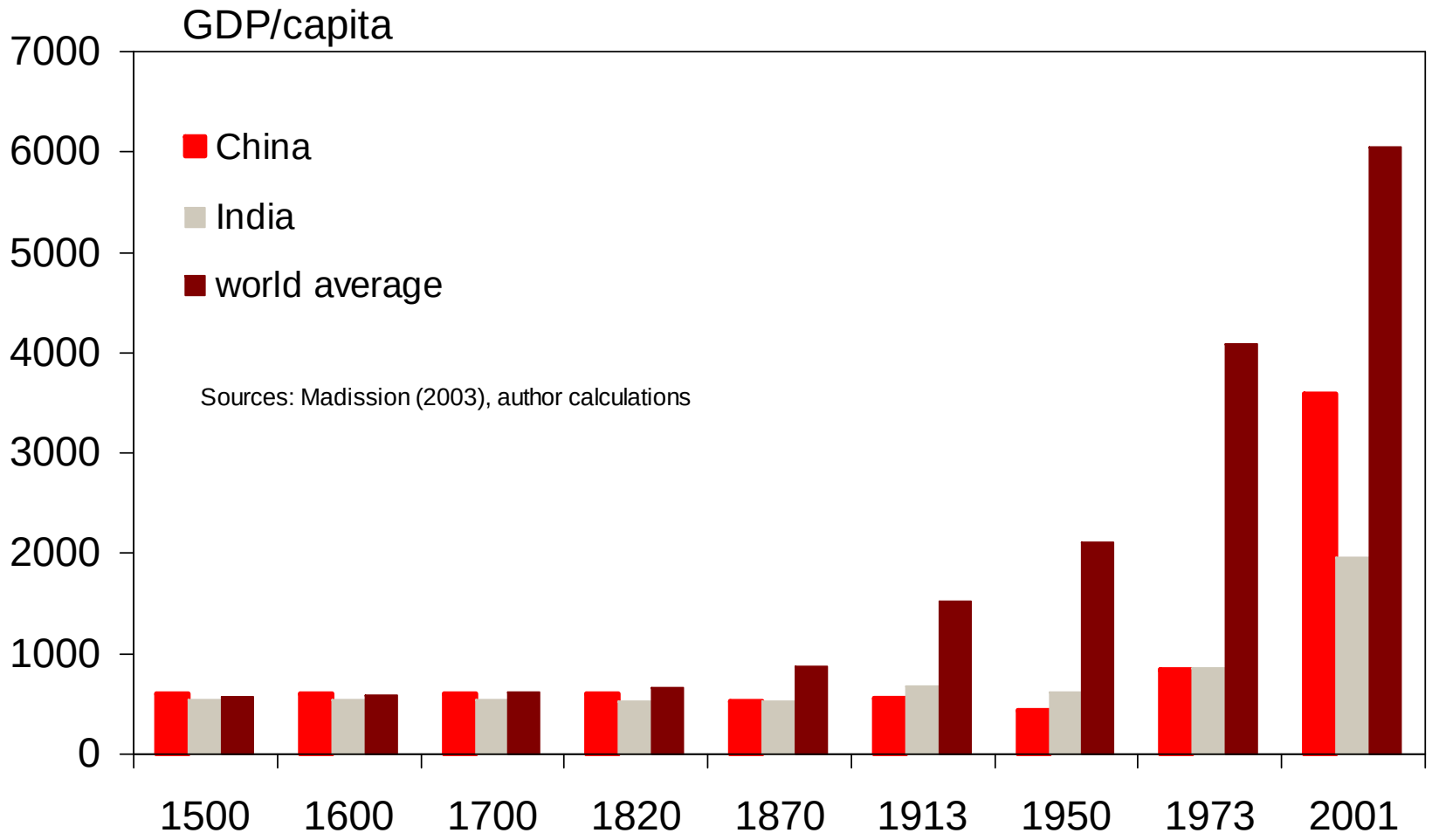
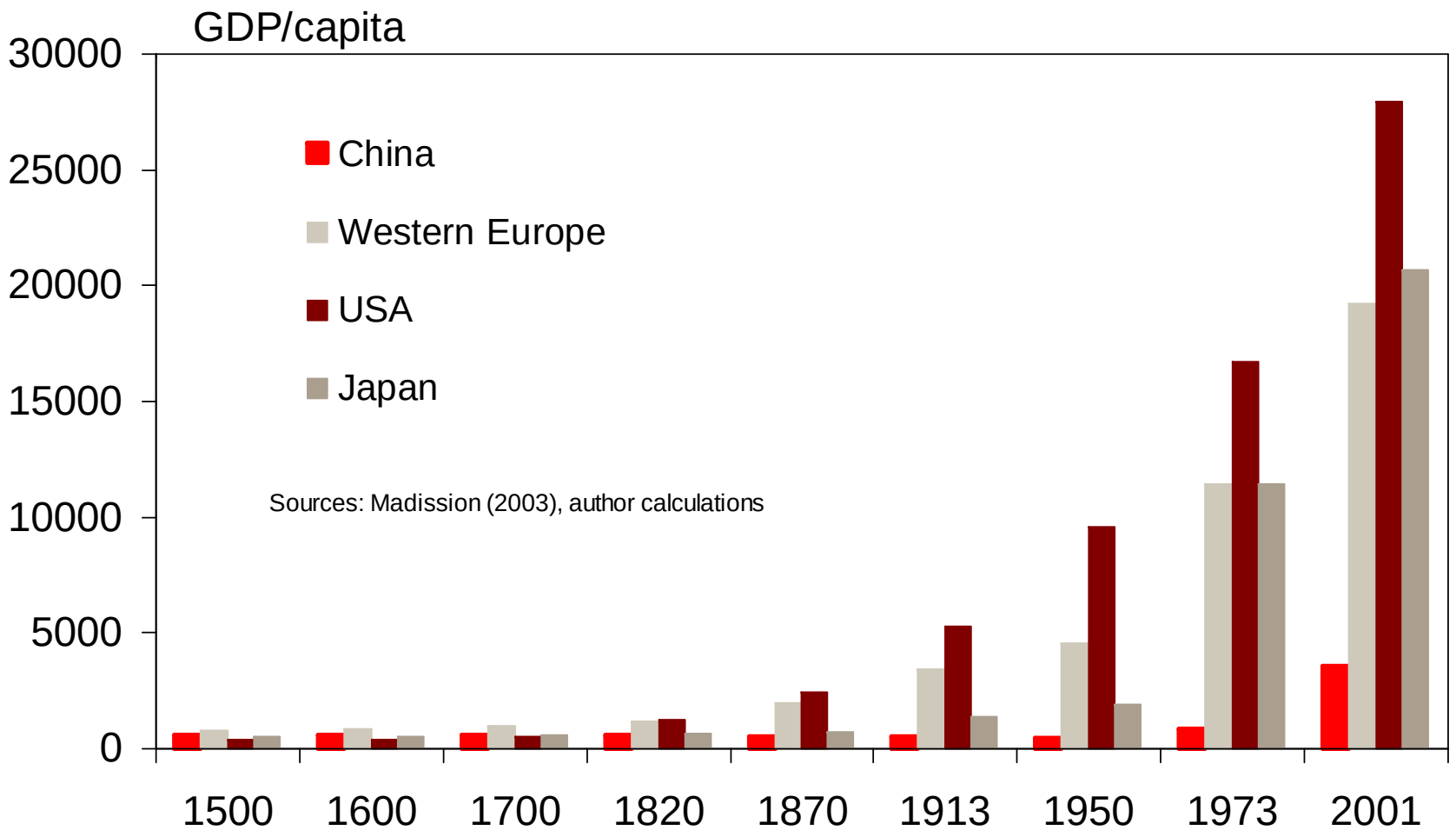


Figure 7.3: The technically adept have surged



Section eight

Australia

Figure 8.1: Distance from the strategic leader

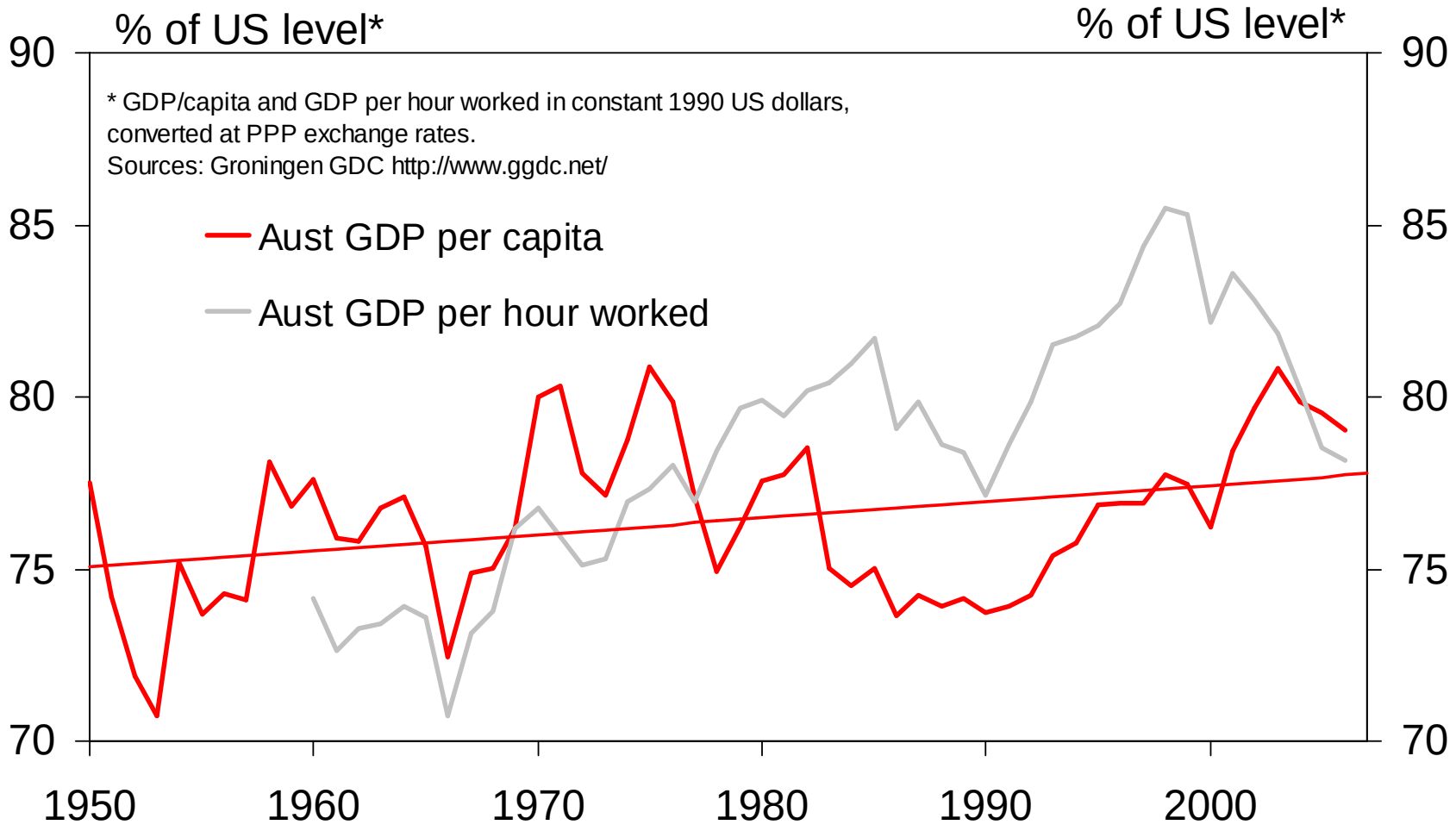


Figure 8.2: Relative living standards

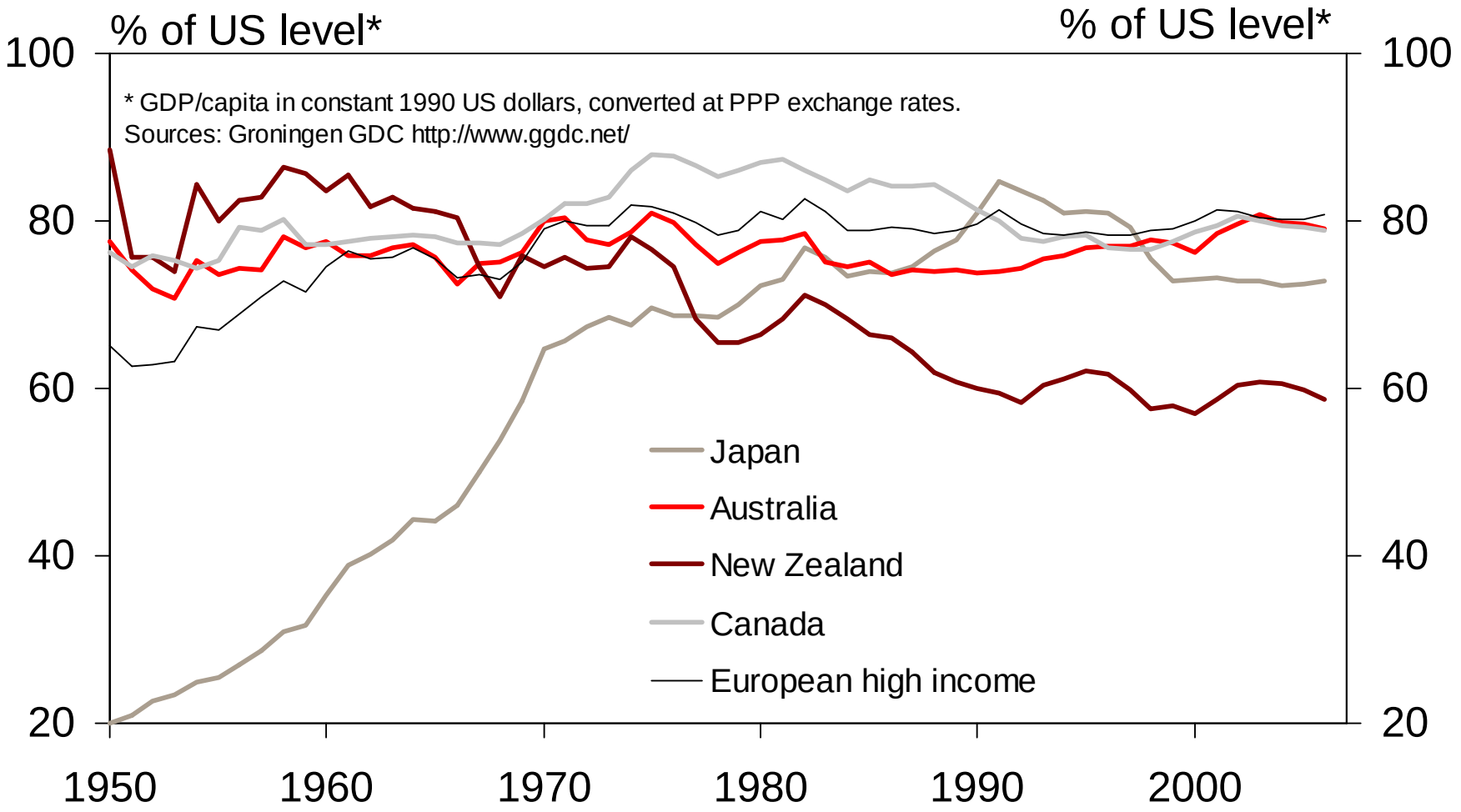


Figure 8.3: The resources boom in perspective

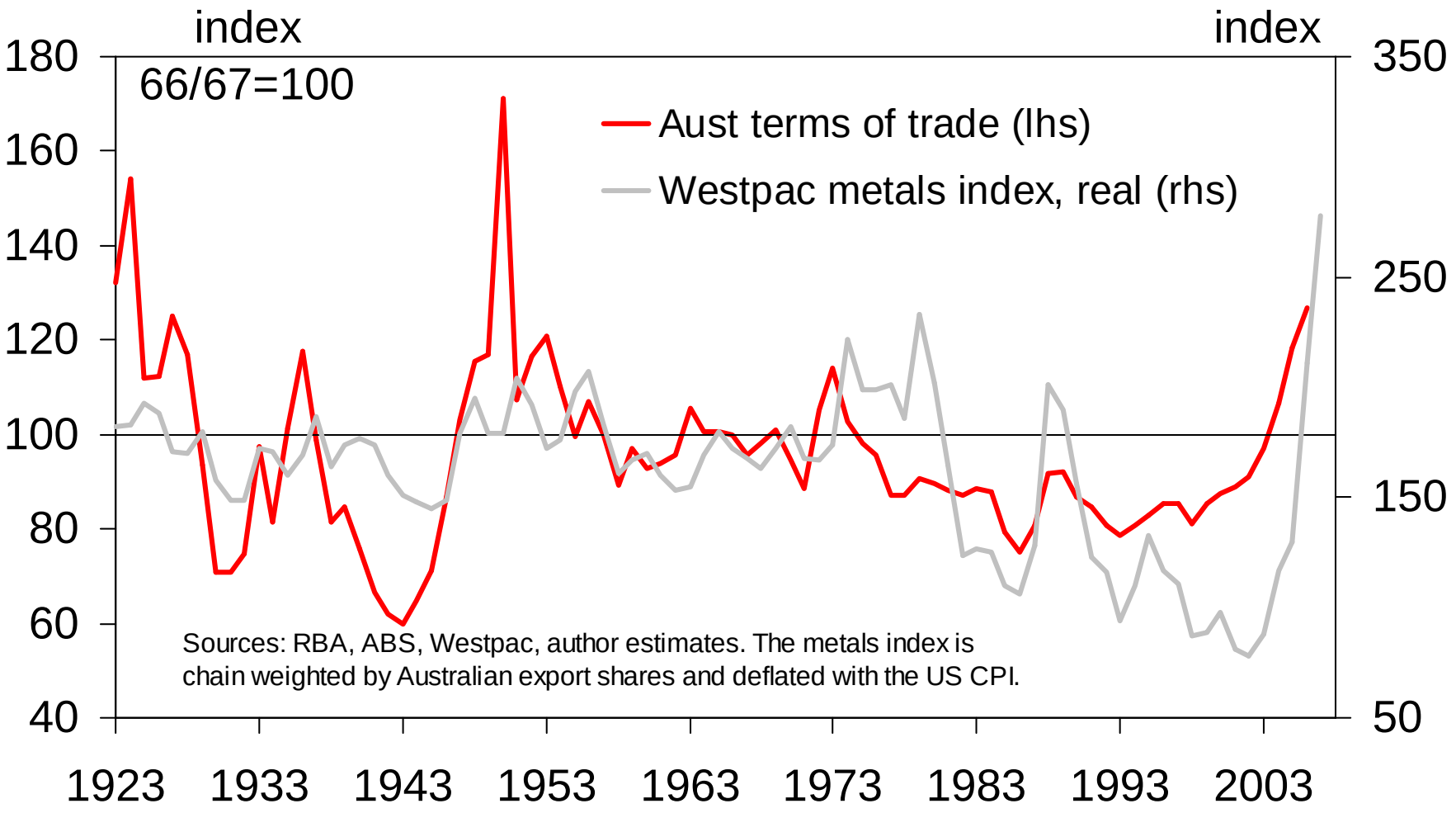


Figure 8.4: Australian resource export volumes

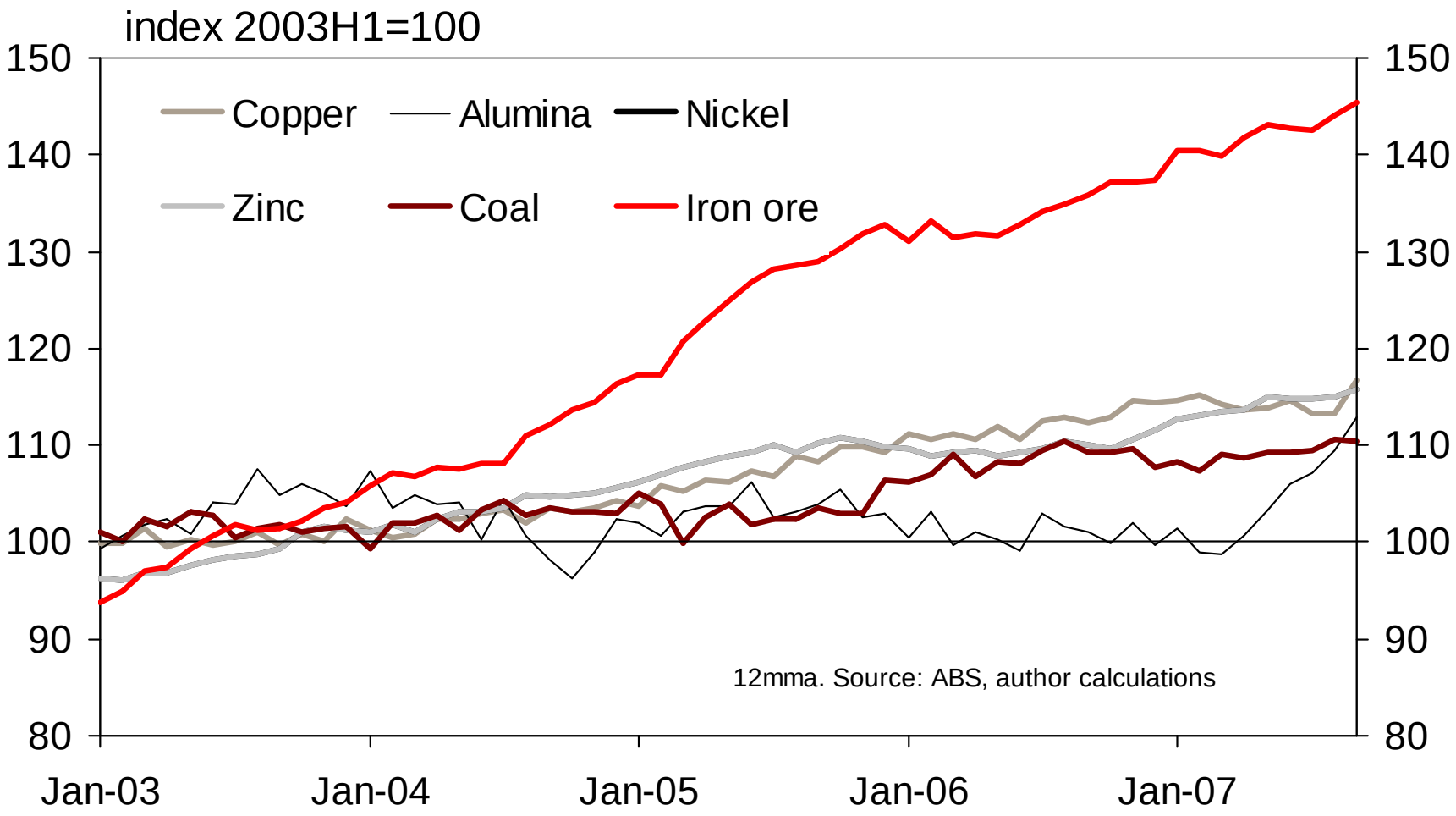


Figure 8.5: Non-commodity export volumes

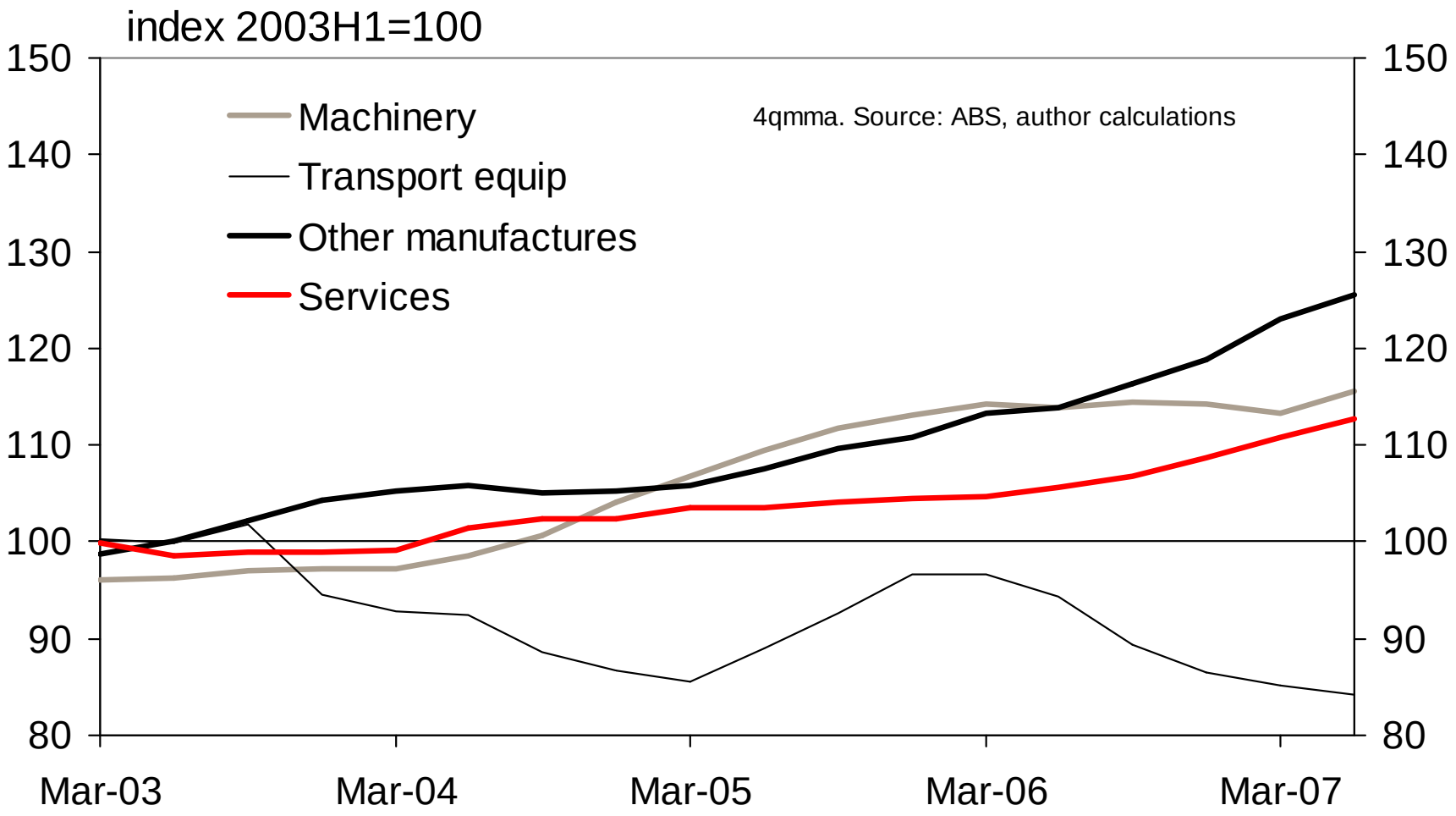


Figure 8.6: Australian business investment cycles

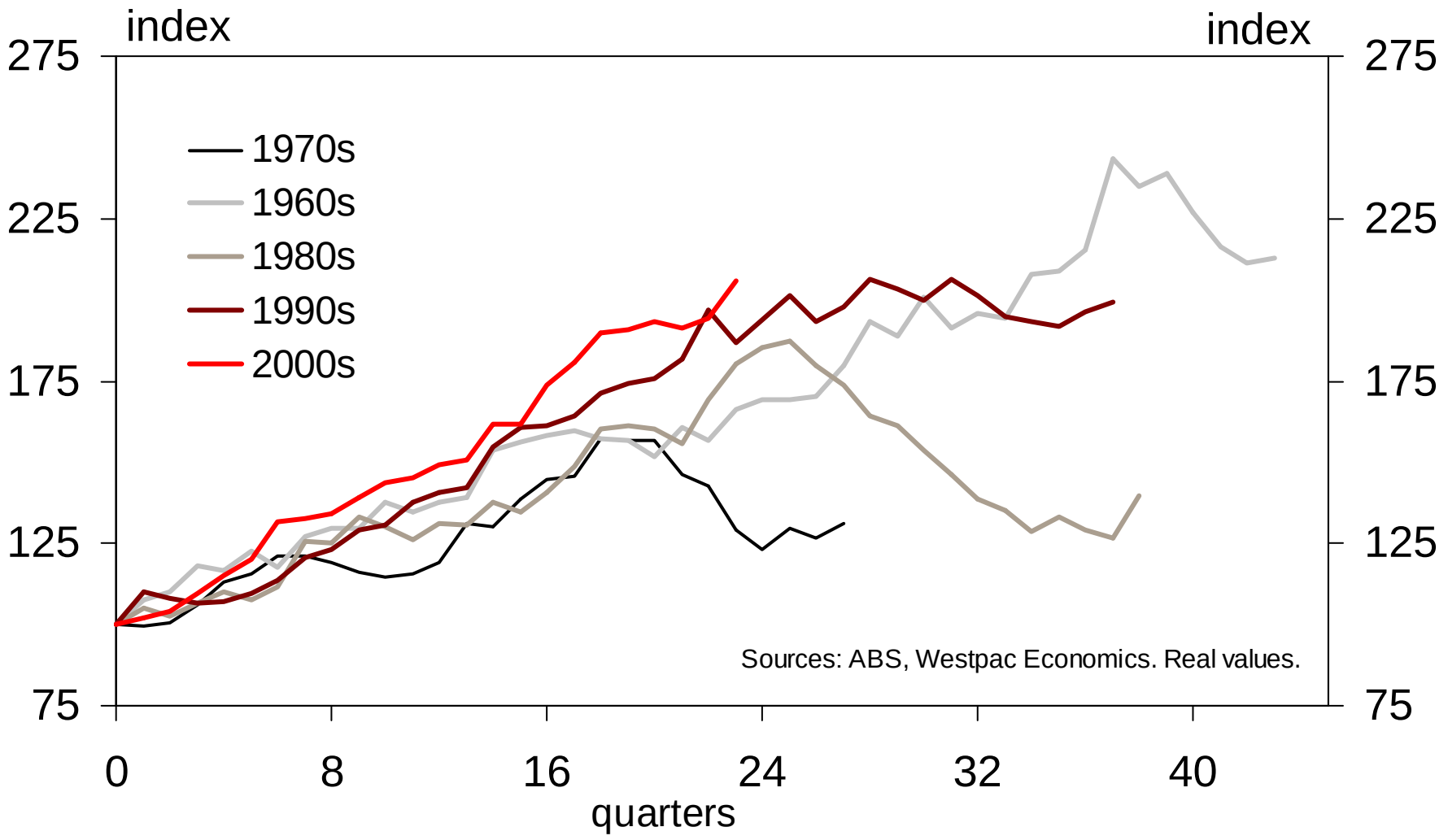


Figure 8.7: The profit share and investment

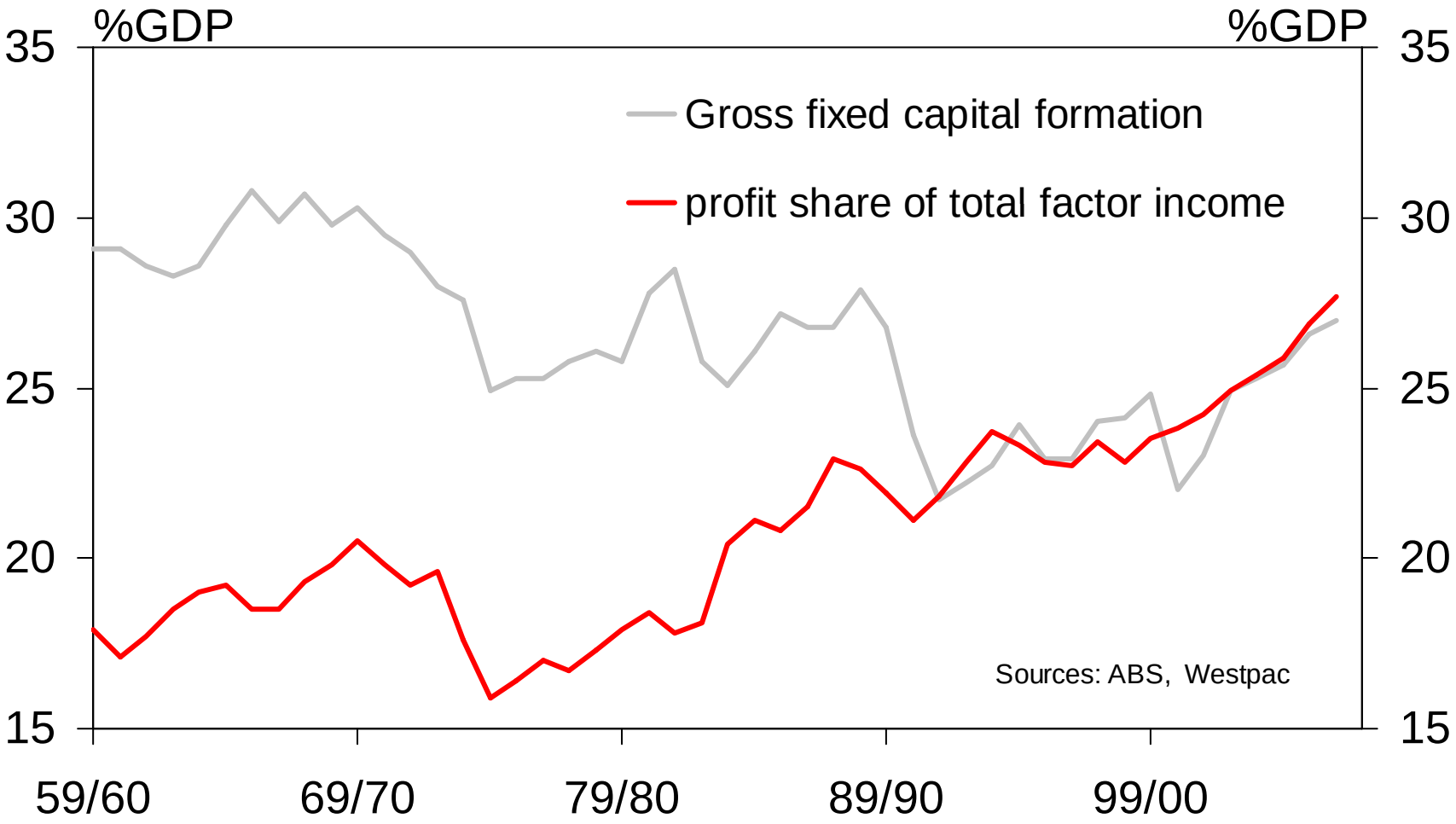


Figure 8.8: Government revenue & spending

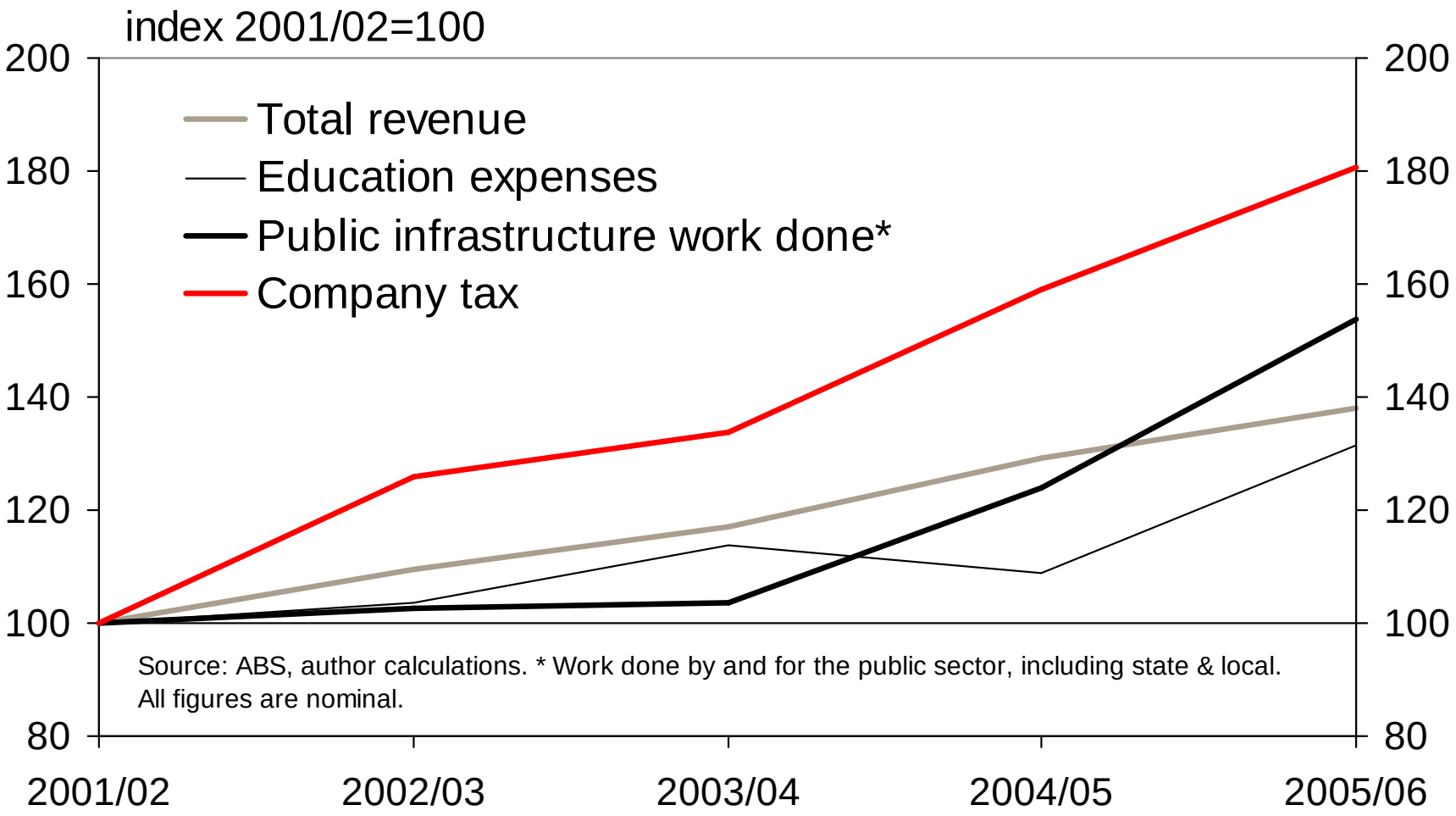


Figure 8.9: Australian education & innovation